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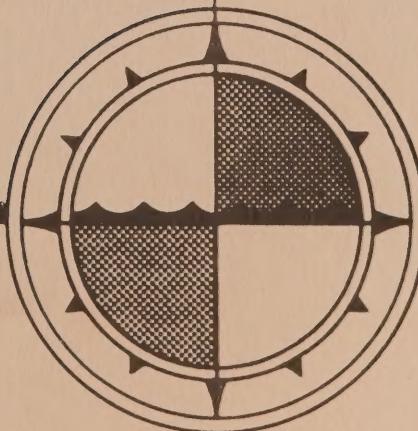
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**A LONG LIFE BATTERY
FOR A
ONE-QUARTER WATT PINGER**

by

M.J. Woodward



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ABSTRACT

A LONG LIFE BATTERY
FOR A

There is often a long-life pinger associated with bottom-mounted oceanographic equipment. A long-life battery for Hall's one-quarter watt pinger is described. Life tests and construction details are presented.

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Sidney, B.C.

1981

Acknowledgments

ABSTRACT

I would like to thank J. G. Morris of Defence Research Electrical Power Division for his help in the solution of corrosion problems in the early stages.

There is often a requirement for long-life pingers associated with bottom-mounted or moored underwater equipment. A long-life battery for Helle one-quarter watt pingers is described. Life tests and construction details are presented.

Acknowledgements

I would like to thank J. G. Moores of Defence Research Establishment Pacific for his recommendations in the solution of corrosion problems in the sea-water return.

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Introduction

For the past ten years the Tides and Currents Section of the Institute of Ocean Sciences has used pingers to assist in locating various instrument packages. We often install pingers with diver-serviced equipment, and since *Pisces IV* has been available to recover equipment in depths less than 2000 m, our current meter moorings have been equipped with pingers. After trying a variety of commercial pingers and batteries, we have developed our own battery pack which we use with Helle one-quarter watt pingers. These have been fitted to all of our pop-up moorings and to many diver-serviced installations over the past two years, with no failures.

Typical pinger use and characteristics

A pinger fitted to a diver-serviced instrument package is often a great convenience, particularly at locations away from the shore or where visibility is poor. Once within range, the divers can swim directly to the instrument package guided by a submersible pinger receiver. The pinger is usually treated only as an aid to location - some other method of location being provided in case of pinger failure. When the equipment has been moved from its original site by ice, fishing nets, etc., a pinger is often indispensable to successful recovery.

A pinger attached to a pop-up mooring employing some type of anchor release can be instrumental to the success of alternate recovery attempts should the release fail to function. Confirmation of the presence and location of the array can lead to recovery by dragging. A submersible can home in on the array and cut it free. Long life is of great importance in the second case as scheduling the submersible and support vessel can require as much as one year of lead time.

A ping rate of approximately one pulse per second has been found to be convenient for location by divers or submersible. Ping rates much slower than this require a steady platform when using narrow beam locators.

The typical range of a one-quarter watt pinger in a Scuba operation, our most common usage, is two kilometres in calm conditions using a Helle model 6270 diver pinger receiver. Similar ranges have been found by *Pisces IV* during the recovery of current meter arrays.

Battery connection and mechanical configuration

The most common connection between pinger and battery is a threaded stud, the negative terminal, protruding from a flat insulating surface of the battery. The connection is made pressure proof by an O-ring seal surrounding the threaded insert in the pinger. The positive battery connection is normally completed by immersion in sea water - an electrode being fitted to both pinger and battery. Corrosion problems can be serious in these sea-water returns in long term installations.

Corrosion can be eliminated by using fully enclosed connections, but the only suitable commercial units that we know of with this configuration have a much reduced pressure tolerance. Another method of enclosing the connections is to seal the pinger and batteries into an oil-filled container. This arrangement can cause considerable reduction in the useful range as the acoustic signal is not radiated coherently from the container. Differing path lengths through the oil and batteries to the container walls result in phase differences between the signals radiated from the different parts of the container. This type of signal impairs the performance of direction sensors using phase comparison.

A problem frequently encountered in using commercial pinger/battery combinations is the complete lack of provisions for attachment. Cages or brackets must be made to suit each application. As almost all of our applications involve some sort of mooring line and float arrangement, provision for attachment was made by incorporating into our battery packs a steel link which is capable of bearing full mooring tension. This arrangement allows the units to be inserted almost anywhere in a mooring line without interfering with other equipment or instruments.

Corrosion in a sea-water return

The corrosion of the sea-water return electrodes was found only in long-term applications. Galvanically accelerated corrosion occurs at the positive electrode in the sea-water return. The material most commonly used for these electrodes is stainless steel alloy 316. Our first experience with serious electrode corrosion was in using a commercial one-year pinger and battery. This was a one watt unit with the sea water battery electrode being negative. Corrosion of the pinger electrode allowed water to reach the electronics. The manufacturer attributed the cause to a poor batch of electrode material.

We have used a number of Helle one-quarter watt units and three month batteries with no failures although we did notice some corrosion of the battery electrode - in this case the positive electrode.



Plate 1.

Mesotech one year battery electrode after four months exposure.

Corrosion can be significantly reduced by directly connecting the external electrodes with a stainless steel strap, but the success of this varies considerably with the water properties at the site.

In 1976 we built some one year batteries for Helle one-quarter watt pingers. These were fitted with battery electrodes consisting of a 316 stainless steel stud protruding through the epoxy battery potting compound. These were used successfully for twelve months at one location then were tried at another location where corrosion of the battery electrode caused failure in as little as three months. As a short term measure, we tried a stainless steel cap which screwed onto the battery electrode and sealed with an O-ring against the battery face. This arrangement eliminated much of the crevice corrosion at the joint between electrode and the potting compound. The stainless steel caps proved satisfactory for periods approaching one year but corrosion still remained a problem, (see Plate 2).

Two solutions to this problem were suggested by J. G. Moores of Defence Research Establishment Pacific. One was to fit a zinc anode to the positive terminal. This proved satisfactory for shorter deployments but we were concerned about the difficulty of maintaining the anode in good contact with the connection stud for long periods. The solution adopted was a positive electrode of an alloy of lead containing 2% silver by weight.



Plate 2. Stainless steel battery electrode with O-ring seal after one year.

These electrodes thread onto the connection stud and seal against the battery face with an O-ring. We have had these electrodes in service now for periods up to two years. After initial formation of lead oxide at the electrode surface, very little change in the electrode takes place with time.

Long life battery pack and test results

Plate 3 shows the two year battery pack constructed at our workshop with Helle pinger and lead/silver electrode. The steel link around which the battery is built is 60 centimetres in overall length of two centimetre diameter mild steel round bar. This provides an axial load capacity of five tons with allowance for corrosion and also serves to support a guard ring which helps to protect the pinger from accidental damage. Fourteen alkaline "D" cells are potted around the link in slow setting epoxy compound.

During a two year experiment off the west coast of Vancouver Island, pinger battery voltage was measured at each mooring service. Sixteen batteries were tested with deployment



Plate 3.

Battery pack built at the Institute of Ocean Sciences with Helle pinger and lead/silver electrode.

times varying from six to twenty-five months due to changes in the number of moorings deployed. No compensation was made for variation in ping rate between the individual units. The pingers used were Helle one-quarter watt units; frequency 27 KHz \pm 2%, ping rate $0.7 \text{ sec}^{-1} \pm 20\%$, pulse length 8 msec \pm 20%, voltage range 12 - 25 VDC, normal voltage 22.5 VDC, average current drain 0.5 mA., and working depth 610 m.

Battery life is a compromise between battery size, power output and ping rate. Large increases in power output are required to increase significantly the effective range of a pinger, particularly at higher frequencies.

The discharge data shown in Figure 1 demonstrate that the battery pack we construct has a life well in excess of two years when operated at our local average sea temperature of 8°C . This would be reduced somewhat at lower temperatures.

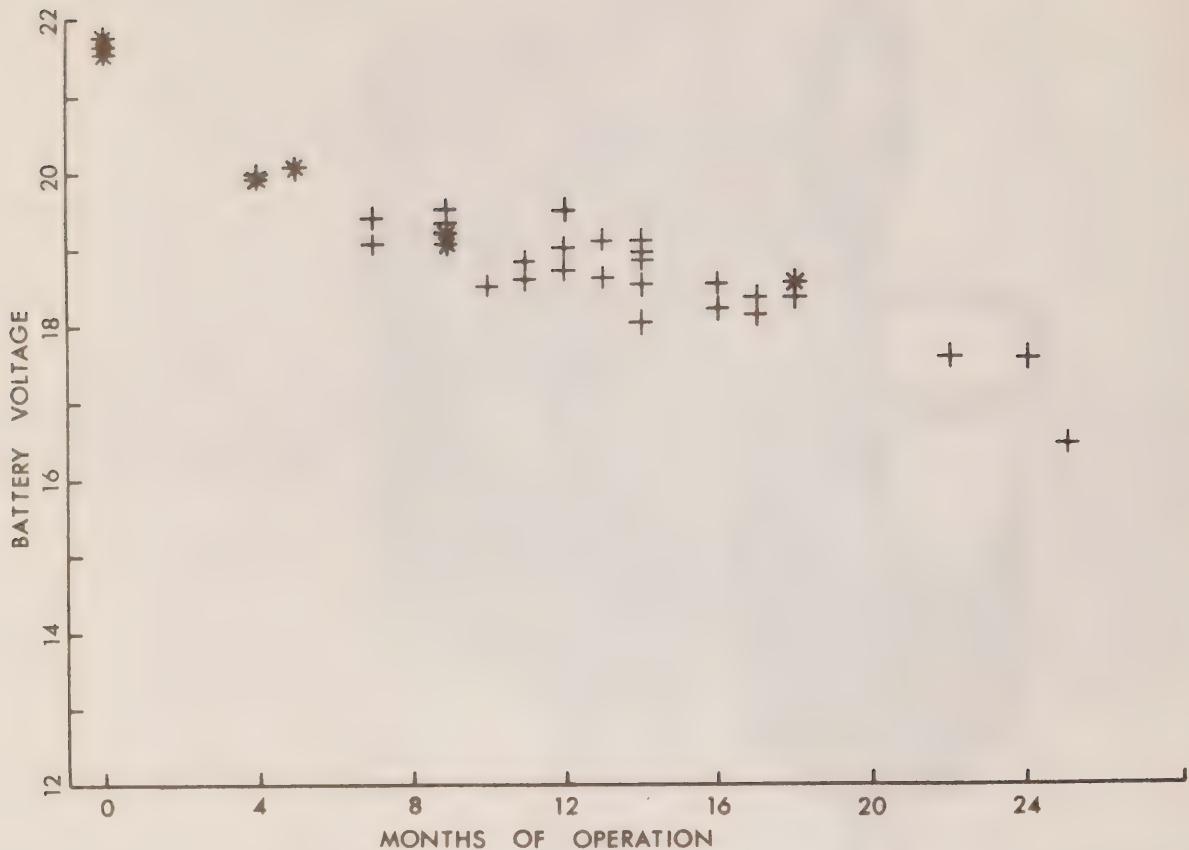


Figure 1. Battery voltage versus time.

Construction method

The battery is cast around the steel link in a two pour vacuum process. The outside dimensions are shown in Figure 2.

The steel link is clamped into a wooden jig and the plastic mold bottom with the connection studs installed is sealed to the link with caulking compound (see Plate 4). The guard ring must be aligned with the pinger connection stud. A shallow circular mold consisting of a one-inch length of five-inch inside diameter PVC pipe is sealed to the mold bottom concentric with the link. This mold is then filled with potting compound to cover the connection studs. Parting agent must not be used as a leak free bond is necessary between this compound and that to be added later around the battery. The assembly is placed under vacuum to eliminate air bubbles in the compound. After the compound has been allowed to cure, the PVC mold is removed, leaving a short cylinder of compound covering the terminals as shown in Plate 5. Fourteen alkaline "D" cells are placed around the link as shown in Plate 6;

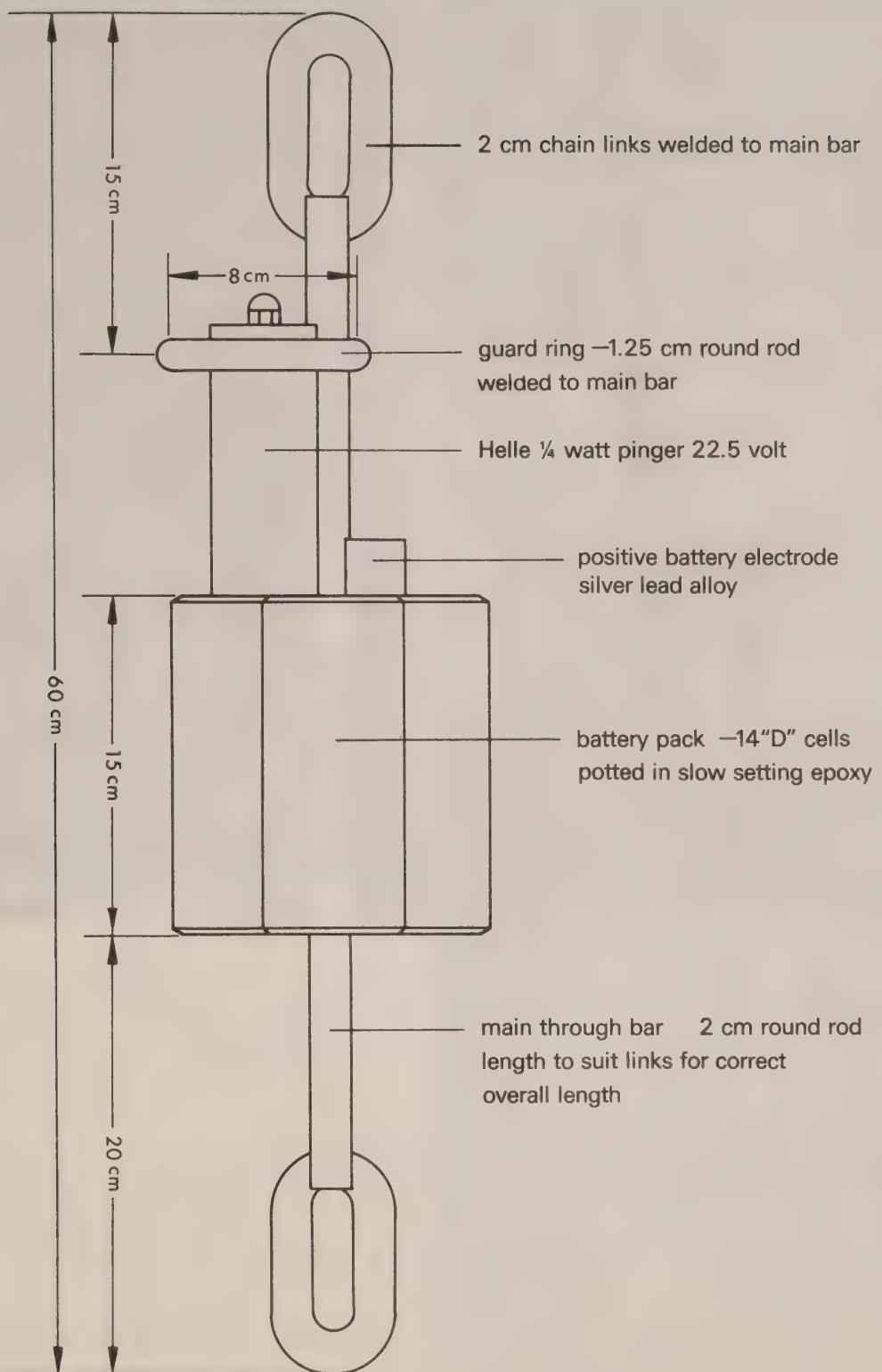


Figure 2. Side view of battery pack with pinger installed.

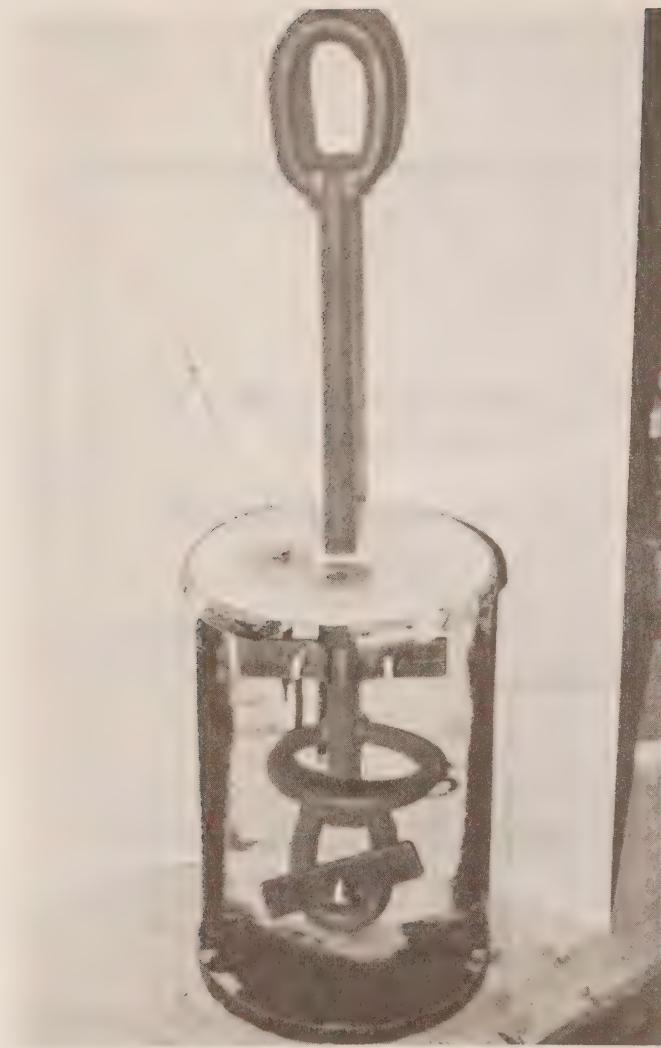


Plate 4.

Link and mold bottom mounted on assembly jig.

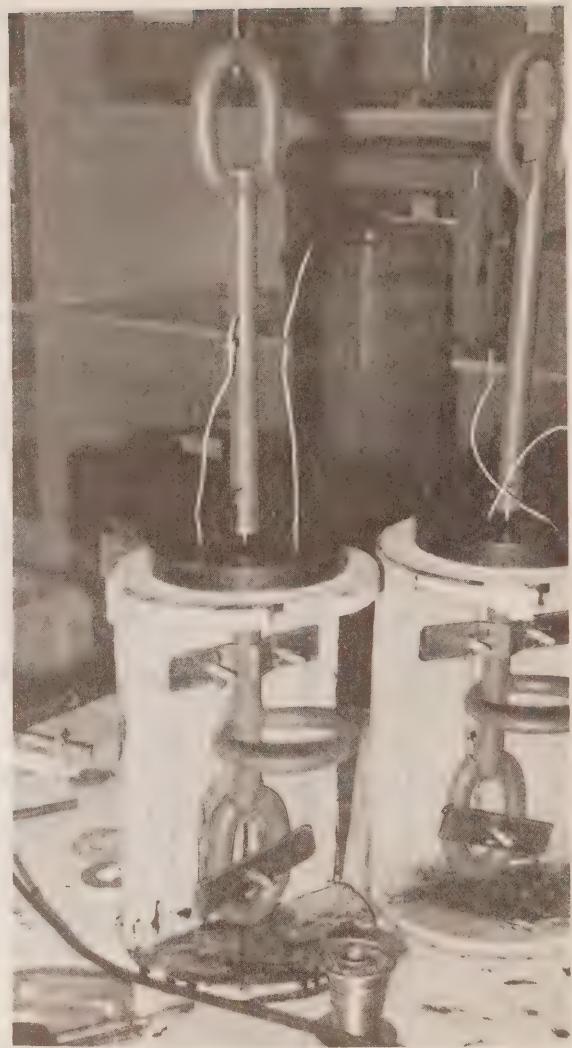


Plate 5.

Link rod and potted connections ready to receive the battery.

then an aluminum mold is fitted over the battery and electrodes and sealed against the mold bottom with caulking compound. The cells must be well clear of the mold wall and link and must be secured from moving while the mold is filled with potting compound (see Plate 7). The potting compound used cures in several days, the slow setting being necessary to avoid internal heat buildup which can damage the cells. As an economy measure the compound around the battery is extended with 3M glass micro-balloons in the amount of 40% of the total volume. To eliminate air bubbles, the assembly is again placed under vacuum. A vacuum chamber for this purpose was constructed of heavy wall plastic pipe (see Plate 8). A clear lid allows a visual check of bubbles rising to the surface of the compound.

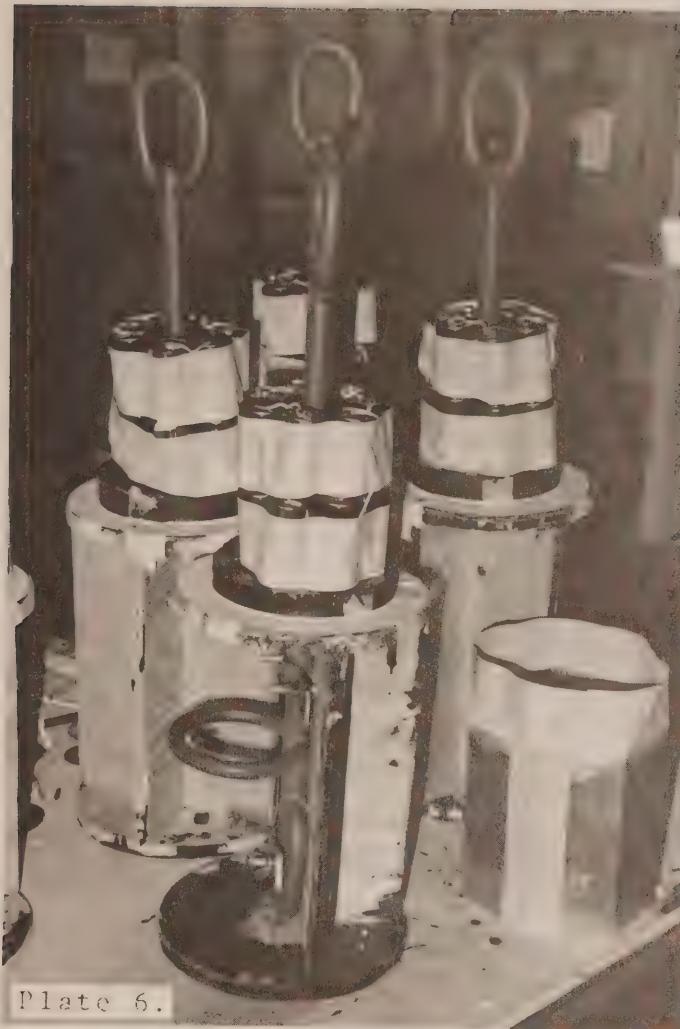


Plate 6.

clockwise from left

Plate 6.
Battery arrangement around link.

Plate 7.
Mold in place ready to receive
potting compound.

Plate 8.
Vacuum system with battery as-
sembly ready for de-gassing.
(scale in feet and tenths)



Plate 7.



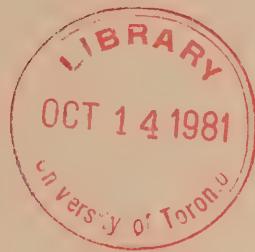
Plate 8.

We build the batteries in batches of five. Approximately one man-day is taken for each batch of five over a period of one week.

Conclusion

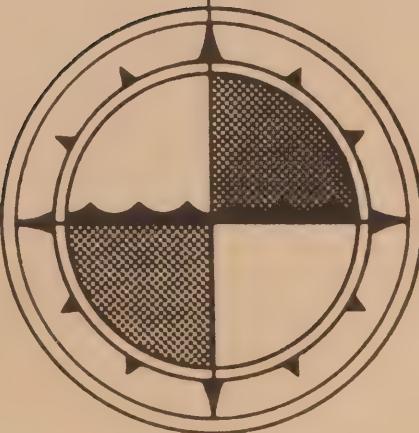
Corrosion of the positive electrode in a pinger battery sea-water return can be all but eliminated by using a positive electrode of an alloy of lead containing 2% silver by weight. Tests show that the batteries we construct for Helle one-quarter watt pingers have an endurance in excess of two years at local sea temperature.

DETERMINATION OF THE OCEANIC WIND MIXED LAYER DEPTH BY AN EXTENSION OF NEWTON'S METHOD



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Sidney, B.C.

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ABSTRACT

This work describes a numerical procedure based on Newton's method for estimating the depth of the wind mixed layer from observed temperature or density profiles. A brief discussion is given on the convergence of this iterative technique for cases not guaranteed by Taylor's theorem. Finally, the main subroutine, the input parameters of the computer program, and some examples are presented.

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Figure 6. A wrong and favourable prediction

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2. Introduction

This note describes a methodology for fitting to data three lines whose intersections are not known *a priori*. Although easily generalized to any number of segments and/or to curvilinear segments, it was found that three linear segments were sufficient for estimating the depth of the wind mixed layer (WML).

The experimentally obtained profiles are truncated at a specified depth that depends on the season and three lines are fitted to the data from the surface to this prescribed depth. The upper (first) line is constrained to be parallel to the depth axis. In the program PROPL0.E (Profiles Plot, version E) emphasis is on the first line, since the second, the so called main thermocline or pycnocline and the third, the "deep layer" are not of concern here.

The processes governing the generation, permanence, and degeneration of the WML are not simple matters and will not be discussed in this paper. Those interested in these aspects are referred to Francis and Stommel (1953), Tabata et al. (1965), Denman (1973), and Elsberry and Garwood (1980), where other related references may also be found.

This note also touches a new hybrid field between classical analysis and statistics named Stochastic Approximation, but a related discussion in depth is not presently intended.

Here, the attention is focused on the specialized problem of fitting to data, in the customary least squares sense, three lines whose intersections are not known. The aims are: a) a brief exposition of the main concepts and b) a brief description and criticism of the computer program and subroutines so that other users may become familiar with their use.

The statistically extended Newton-Taylor (SENT) method is based on the observation that the boundaries of validity of the Taylor series expansion, (Courant, 1970), may be extended to include cases in which the derivatives involved are not everywhere continuous. These cases arise in statistical problems, in which, the concept of convergence is not that of Cauchy, (Courant, 1970), but a generalized one called statistical or stochastic convergence.

3. Related Techniques

As far as we know, there are six other ways in which the depth of the WML could be estimated.

- a) The visual method which will always be the final judge. The program PROPL0.E presents on the cathode ray tube, for all the profiles, the points and the achieved lines so that the user will be able to check and finally decide which values of the estimated WML depths are to be stored on file.
- b) The method used in oceanography which is based on identification of maximum curvature of the profiles. Problems arise with noisy profiles and

when dealing with σ_t profiles not corrected for the effect caused by the difference in time constants of the temperature and conductivity sensors of the measuring instruments. These problems cause this method to depend heavily on (a). Thus the statistical problem of "objective" separation of populations is not faced "objectively."

In spite of the above, this method is not to be abandoned because, if combined with smoothing processes, it is capable of generating good initial values for the iterative SENT method. Even the previously mentioned (in b) instrumental shortcoming could be used as a good indicator of the separation of layers.

- c) A category of methods based on a patent by Hough (1962) are widely used in the field of pattern recognition, cybernetics, artificial intelligence, and in the analysis of images from satellites. These methods by means of the original Hough transform, or of a generalization of it, (Shapiro, 1978), substitute the problem of curve fitting with a problem of clustering. Theoretically, they are of great importance; however in oceanography, as far as we know, they are not yet widely used.

These methods appear to require greater computational effort than the SENT method. In the SENT method the structure of clusters is faced in a straightforward manner.

- d) The combinatorial methods (Caperon et al., 1968; Hudson, 1966). In the case of the three line fit (3LF) the combinatorial methods will try all possible combinations. The variances of the fits are compared and finally the combination with the minimum variance is chosen. Such methods became popular as the first computers appeared, but lost favour when continuous recording oceanographic instruments were put in wide usage. Even with the present computers these methods become increasingly impractical as the number of data points increases.

The theoretical importance however of the combinatorial methods remains unshaken. The most effective theoretical proof of the existence of a global minimum that the SENT method requires is based on combinatorial considerations. Also, these methods could give very good initial values, if combined with a proper scheme of reducing the number of data points either by sampling (decimating) or by grouping and averaging.

- e) The sequential methods. Here, starting from the surface, lines are fitted until a depth in which a prescribed relative threshold in the sum of the squared residuals (SSR) of the fit is surpassed. There is some arbitrariness in the definition of the relative threshold which further depends on each individual profile. This method is used in the program PROPLO.E, as a last resort, if the SENT method fails because of various singularities in the formed system of normal equations. These singularities depend on the data and on the numerical errors and are well understood. The depths computed by the sequential method are thus only recommended.
- f) The methods based on the "spirit" of Dynamic Programming (Bellman and Roth, 1969). The main contribution of Dynamic Programming is that the number of possible combinations is made to depend on the degree of required

accuracy. Thus, even continua of data end up with a finite number of segment fits. Here we briefly note that the SENT method is a one-stage process only i.e. it does not need to estimate first one optimal line then two and finally three lines. Thus extra computational cost is avoided.

A qualitative comparison of the computational cost between the various combinatorial techniques and the SENT method is given in Fig. 1. We have not conducted experiments to define these average curves for the Univac 1106 computer, but there are qualitative indications suggesting that the critical point N_c is less than 15 and that for 169 data points, SENT is 50-60 times faster.

4. Newton's Method

Let us now consider a real function of one real variable x and of k parameters: $F = F(x, C_1, C_2, \dots, C_k)$.

If the first partial derivatives of F according to the parameters exist and are continuous, the first order expansion of F , according to Taylor's theorem, is:

$$F^{(1)} = F^{(0)} + \Delta F^{(0)} \approx F^{(0)} + DF^{(0)}$$

where

$$DF^{(0)} = \sum_{j=1}^k \left(\frac{\partial F}{\partial C_j} \right)^{(0)} \cdot (\Delta C_j)^{(0)}$$

or

$$F^{(1)} = F^{(0)} + \sum_{j=1}^k \left(\frac{\partial F}{\partial C_j} \right)^{(0)} (\Delta C_j)^{(0)} \quad [1]$$

See Figure 2.

It is assumed that the variable x will remain constant in any of its values. What we attempt to show is that by means of [1], from the value $F^{(0)}$ of F in position (0) , we could reasonably approximate the value $F^{(1)}$ if the change in position (in the parameter space) from (0) to (1) is small, the first derivatives in this interval exist and are continuous, and if we know them in position (0) .

We also consider the coordinates of the N experimentally obtained points (x_i, y_i) , $i = 1, 2, \dots, N$ and the differences (residuals):

$$R_i^{(1)} = F^{(1)}(x_i, C_1^{(1)}, C_2^{(1)}, \dots, C_K^{(1)}) - y_i \quad [2]$$

or via [1]

$$R_i^{(1)} = F^{(0)} + \sum_{j=1}^K \left(\frac{\partial F}{\partial C_j} \right)^{(0)} (\Delta C_j)^{(0)} - y_i \quad [3]$$

Our aim is to select the corrections $(\Delta c_j)^{(0)}$ so that $H = \sum_{i=1}^N (R_i^{(1)})^2$ is

a minimum. In this way we hope to obtain successively better and better fit of the parametric function F with the data. (See Fig. 3.)

Essentially, using this method, we have "linearized" a nonlinear problem in the parameters. The least squares problem arising from the condition $H = \text{minimum}$ is linear in the corrections. Thus, starting with initial values or guesses: $c_j^{(0)}$, $j = 1, k$, we compute the optimal corrections: $(\Delta c_j)^{(0)}_*$ so that the new values: $c_j^{(1)} = c_j^{(0)} + (\Delta c_j)^{(0)}_*$ when put in the function F will give an improved representation of the data.

We could stop the iteration if the maximum value of the set of relative corrections becomes less than a preassigned number, or if the sum of squared residuals of the fit starts to increase. This is certain to happen even for theoretically known convergent iterations, and in this case, it is due to rounding errors which are unavoidable in any actual computation.

5. Application of the SENT Method

Newton's method requires continuity in the derivatives of F with respect to its variables and parameters. This is not satisfied if the function F is a sequence of line segments. Thus, it was thought that this method could not resolve the problem of three line fit.

As we will see, even in the case of discontinuity in the derivatives of F, Newton's method can be applied provided that certain statistical conditions are fulfilled. Because of this we called our method "Statistically Extended Newton-Taylor" method also giving credit to Taylor. For the three line fit, first we have to construct the function F according to the constraints of the given problem. If for example no other constraints are imposed except continuity and single valuedness of F, the function F will be given as in Table A (see also Fig. 4), and its partial derivatives as in Table B.

TABLE A: THE FUNCTION F:

$F = f_l + f_m + f_r$ where:

$$a) \quad f_l = \begin{cases} S(x-A)+B, & \text{for } \{x \leq A\} \\ 0, & \text{for } \{x > A\} \end{cases}$$

$$b) \quad f_m = \begin{cases} 0, & \text{for: } \{x \leq A\} \\ \frac{(Q-B)x+BP-AQ}{P-A}, & \text{for } \{A < x \leq P\} \\ 0, & \text{for } \{x > P\} \end{cases}$$

$$c) \quad f_r = \begin{cases} 0, & \text{for } \{x \leq P\} \\ T(x-P)+Q, & \text{for } \{x > P\} \end{cases}$$

TABLE B: THE DERIVATIVES OF F:

$$\frac{\partial F}{\partial S} = \begin{cases} x-A, & \text{for } \{x \leq A\} \\ 0, & \text{for } \{x > A\} \end{cases}$$

$$\frac{\partial F}{\partial A} = \begin{cases} -S, & \text{for } \{x \leq A\} \\ \frac{(Q-B)(x-P)}{(P-A)^2}, & \text{for } \{A < x \leq P\} \\ 0, & \text{for } \{x > P\} \end{cases}$$

$$\frac{\partial F}{\partial B} = \begin{cases} 1, & \text{for } \{x \leq A\} \\ \frac{P-x}{P-A}, & \text{for } \{A < x \leq P\} \\ 0, & \text{for } \{x > P\} \end{cases}$$

$$\frac{\partial F}{\partial P} = \begin{cases} 0, & \text{for } \{x \leq A\} \\ \frac{(B-Q)(x-A)}{(P-A)^2}, & \text{for } \{A < x \leq P\} \\ -T, & \text{for } \{x > P\} \end{cases}$$

$$\frac{\partial F}{\partial Q} = \begin{cases} 0, & \text{for } \{x \leq A\} \\ \frac{x-A}{P-A}, & \text{for } \{A < x \leq P\} \\ 1, & \text{for } \{x > P\} \end{cases}$$

$$\frac{\partial F}{\partial T} = \begin{cases} 0, & \text{for } \{x \leq P\} \\ x-P, & \text{for } \{x > P\} \end{cases}$$

We thus have six free parameters to estimate: S, A, B, P, Q, T, where (A,B), (P,Q) are the intersection points, and S,T, slopes. Note that z (depth) corresponds to x, t (temperature for example) corresponds to F and the slope dt/dz of the uppermost layer corresponds to S. The slope of the thermocline can be inferred; the slope of the deeper layer corresponds here to T. For S = 0 there are only five parameters to be estimated. The appropriate F and its derivatives could be obtained from Tables A and B by an easily performed modification. This case is realized by the subroutine FSZ3LF (First Slope Zero, 3LF) in Appendix I.

After construction of F and its derivatives two major problems have to be faced: 1) the choice of initial values and 2) the convergence of the iterative scheme. These two problems are of course related; however, the problem of convergence appears to be the most important.

Regarding the problem of choosing the initial values we must have assurances that the iteration will start in the neighborhood of the global minimum, or, in the neighborhood of any other desired local minimum.

As indicated in part 3, we could use a number of methods for the estimation of good initial values. In the present form of the program PROPL0.E (Profiles Plot, version E), the subroutine WMLTLF calls the subroutine WINMIL, which by calling other subroutines prepares three different sets of initial values. These sets come from the estimation of the first five, in absolute order, extrema of d^2F/dx^2 (or d^2t/dz^2). Actually only the points (A,B) and (P,Q) are computed. The initial values for the slope T is estimated in the main subroutine FSZ3LF.

All three sets of initial values are tried, the results are stored and the set with the minimum sum of squared residuals of fit is chosen. With a minimal change in the program, one could be able to choose either of the remaining two sets of secondary minima. These, by assumption, will correspond to main transient layers.

6. Convergence

As can be verified from Table B, the derivatives $\partial F/\partial S$, $\partial F/\partial B$, $\partial F/\partial Q$, and $\partial F/\partial T$, are continuous in the domain $[\min\{Y_i\}, \max\{Y_i\}]$, $i = 1, 2, \dots, N$, for all the possible values of x, A, and P. If we consider the data (X_i, Y_i) ordered in x, the domain of values for x, A and P can be defined as: $[X_1, X_N]$. In this domain the derivative $\partial F/\partial A$ is not continuous at the position $A = x$, and the derivative $\partial F/\partial P$ is not continuous at the position $P = x$. Given that x enters in the computation as a set of N discrete values X_i , problems will be generated, especially when the optima, A_* and P_* , happen to coincide with one of these abscissae.

Below we try to express the significance of the requirement for continuity in $\partial F/\partial A$ and $\partial F/\partial P$.

As we mentioned in part 4, [1] helps us predict the value of F in position (1) from position (0). If we make a wrong prediction [3] may give for some "not favorable" cases a difference R_k bigger than the actual, or for some other "favorable" cases a difference R_k smaller than the expected.

These then will be "outliers" among the rest of the R_i differences and thus spoil the average optimal correction as computed by the system of normal equations.

In Fig. 5 we present a "wrong" and "not favorable" prediction. In Fig. 6 a "wrong" and "favorable". In both pictures the sign * refers to derivatives from the right of A, and the sign ♦ refers to derivatives from the left of A.

In Fig. 7 we try to show that due to the discontinuity of the derivative in position A, we will make wrong predictions, say, to the right of A, not only predicting from A, but also from any other position in the interval $[A-\Delta A, A]$.

In order to face the problem of wrong predictions we have three main alternatives: 1) to be informed where the above phenomena occur and avoid predictions from the corresponding positions. Doing this, we lose some wrong predictions, which is desired, but we will not have N predictions in each iteration. This will reflect as a loss in the confidence of our estimate. 2) Modify the function so that in the interval $(A-\Delta A, A+\epsilon)$, where $\epsilon \ll \Delta A$, the derivative appears average in a sense, and continuous. 3) Make the interval ΔA as small as possible.

If the optimum, A_* , happens to coincide with one of X_i then policy 3 will not work. The reason is that A_* is the outcome of the limit $\Delta A \rightarrow 0$. However, depending on the number and the magnitude of the wrong prediction it is possible even in this case to have a good approximation.

In the subroutine FSZ3LF, we force NOPI (Number of Permissible Iterations) iterations and we pick up the one which achieved the minimum total sum of squared residuals (SSR).

The above can be justified as follows:

If $A_* = X_i$, $i = 1, 2, \dots, N$, and the number and magnitude of wrong predictions are not great in comparison with the correct ones, eventually, each step of the iterative process will lead to smaller and smaller ΔA eliminating at the end the number of wrong predictions. In this case, the wrong and not favorable predictions may be called "indifferent" as they do not affect the limit.

The importance of good initial values is again apparent here. But this is not the only problem. We are in the area of global minimum. The direction towards the minimum is in question. The confusion in the direction can not be overcome if the optimum, A_* , happens to coincide with one of X_i , for example the X_K .

Independent of how small ΔA becomes, and of how the rest of R_i will tend to zero, the difference R_K may have such a magnitude as to make the new optimum ΔA greater than the previous one; then, the same forces that gave the previous smaller ΔA may take over again. Thus, instead of convergence we will have oscillations; and these oscillations occur not because of the rounding errors but because of the discontinuity in the derivative $\partial F / \partial A$.

What has just been described constitutes a limiting circle of accuracy. Depending on the data and on the form of F , this circle may have a diameter less than the average experimental error. In the program, the preassigned accuracy is purposely put to be higher than the experimental. If we do not have a normal return complying with this accuracy, we still could have a reasonable approximation by picking up the iteration which most closely approached the limit. An analogue to this is the concept of "practical stability" described by La Salle and Lefschetz (1961, p 121).

For example, if in the data of Fig. 10 we introduce the "outlier" ($t = -0.72$, $\text{SiO}_3 = 188$) and use the unconstrained version of having six free parameters for estimation, we have as outcome the values: $S_* = 41.2153$, $A_* = 0.0479$, $B_* = 118.9043$, $P_* = -0.7193$, $Q_* = 111.2840$ and $T_* = -68.1186$ (note that the potential temperature corresponds to $-x$ axis, and the SiO_3 corresponds to y axis). On the other hand, via the combinatorial method, we receive the correct answer; $S_* = 41.213$, $A_* = -0.0487$, $B_* = 118.9275$, $P_* = -0.72$, $Q_* = 111.1393$ and $T_* = -69.7956$. Here the value $P_* \equiv t = -0.72^\circ\text{C}$ causes the problem. Around the above SENT solution, which happened at the 13th iteration, the average relative correction of the most poorly estimated parameter was 7%. The initially imposed relative accuracy was 10^{-9} , which physically is not a realistic value, and the permissible iterations were 50.

The number of data points was 170 and for the 50 iterations, the CPU time was 22.36 seconds. For the combinatorial, the same time was 185.27 seconds. These times do not include the time spent for ordering the data (in x). This of course is one of the worst cases for the SENT method, but still it was eight times faster than the combinatorial method. The values from the SENT method correspond to a $\text{SSR} = 10445.118$ squared silicate units while the correct values from the combinatorial to a $\text{SSR} = 10440.756$. Hence the combinatorial was only 0.04% better. We note also that the SENT method, starting with $\text{SSR} = 14184.067$, had already achieved $\text{SSR} = 10469.658$ in the 7th iteration.

The fit in Fig. 10 does not include the previous outlier. Both methods give practically identical results as their disagreement in the estimation of the parameters starts at the fourth digit after the decimal point. These values are $S_* = 42.1161$, $A_* = -0.0146$, $B_* = 117.7452$, $P_* = -0.5128$, $Q_* = 115.1726$, $T_* = 45.5904$. The SSR of the fit is: 4045.0. The method SENT achieved the limit in 11 iterations consuming 2.626 seconds of CPU time. The combinatorial took 186.948 seconds. These times include ordering the data and preparation of the plot file. Notwithstanding the differences in the two programs, and the fact that both could be further optimized, we could safely conjecture that for 169 data points the SENT method is 50-60 times faster than the combinatorial.

Ending the previous account, we could add that the mean correction around the most successful iteration could serve as an indication of the statistical ratio of the magnitude of the wrong predictions to the magnitude of the total correct predictions. As such, this ratio may characterize the quality of convergence.

Regarding the policy followed in case that the optimum, A_* , or P_* , or both happen to coincide with one of the abscissae X_i , one of the first two

earlier mentioned alternatives is recommended.

In our program we follow a different policy. The subroutine WINMIL calls subroutine TRIDAP which by linear interpolation triplicates the original data points. This is not good mathematics, if the assumptions about the interpolation and sampling schemes are not explicitly given. We believe however that the introduced numerical deviation is covered by the experimental errors. In addition to this, we would like to have a test of the hypotheses about stochastic convergence, and a proof of the fact that: the more data points, the better the method SENT works.

A safer and more elegant way would be to take notice of the coincidence of A_* or P_* or both with one of X_i and call another subroutine which will realize the solution of the corresponding constrained problem. This is currently in preparation.

7. Acknowledgements

The basic observation on which this work depends, was inspired by the work of Caperon (1968) and further discussions in 1968-69 with Dr. John Caperon. We thank Dr. R.E. Thomson for his encouragement, constructive criticism, and review of the manuscript; Dr. S. Tabata for his help and advice in the oceanographic aspects; Dr. E. Carmack for his enthusiasm and stimulating discussions; Miss P. Kimber for the drafting, and Miss T. Lehman and Miss A.L. Mathias for the careful typing.

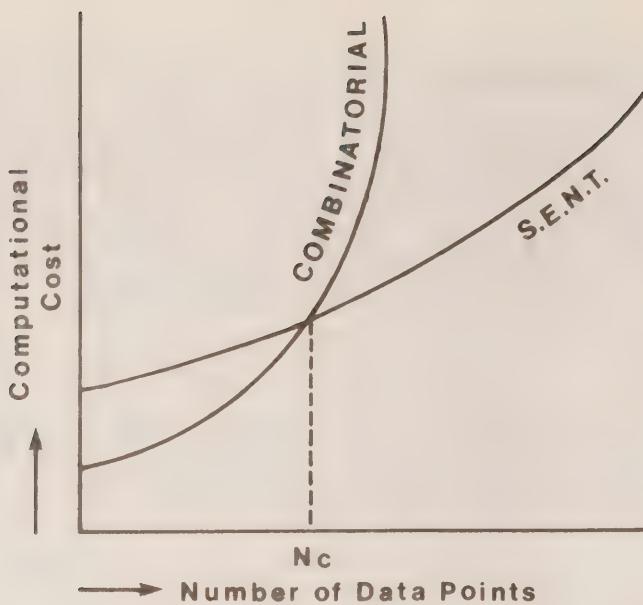


Figure 1. Comparison between the combinatorial and the SENT methods

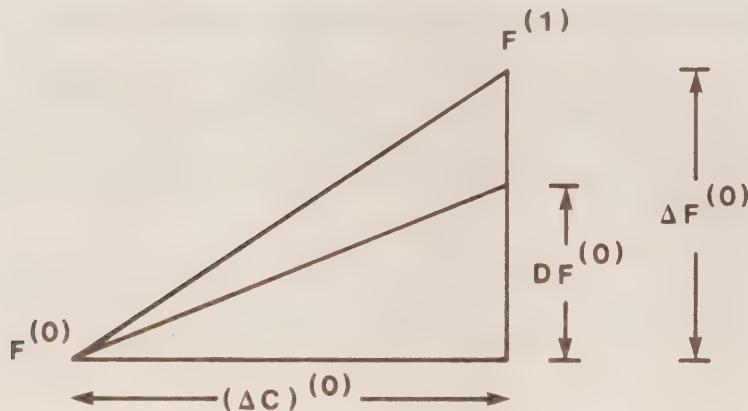


Figure 2. Geometrical interpretation of Taylor's first order expansion

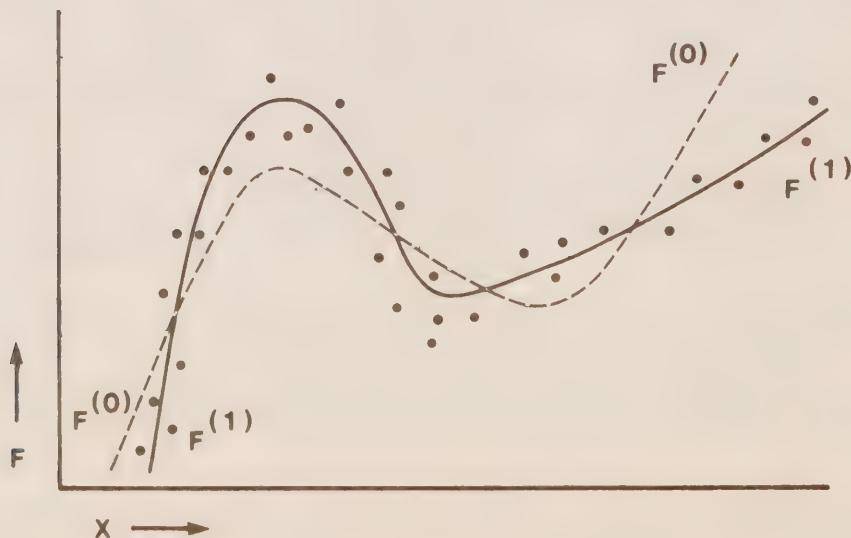


Figure 3. Example of an iteration

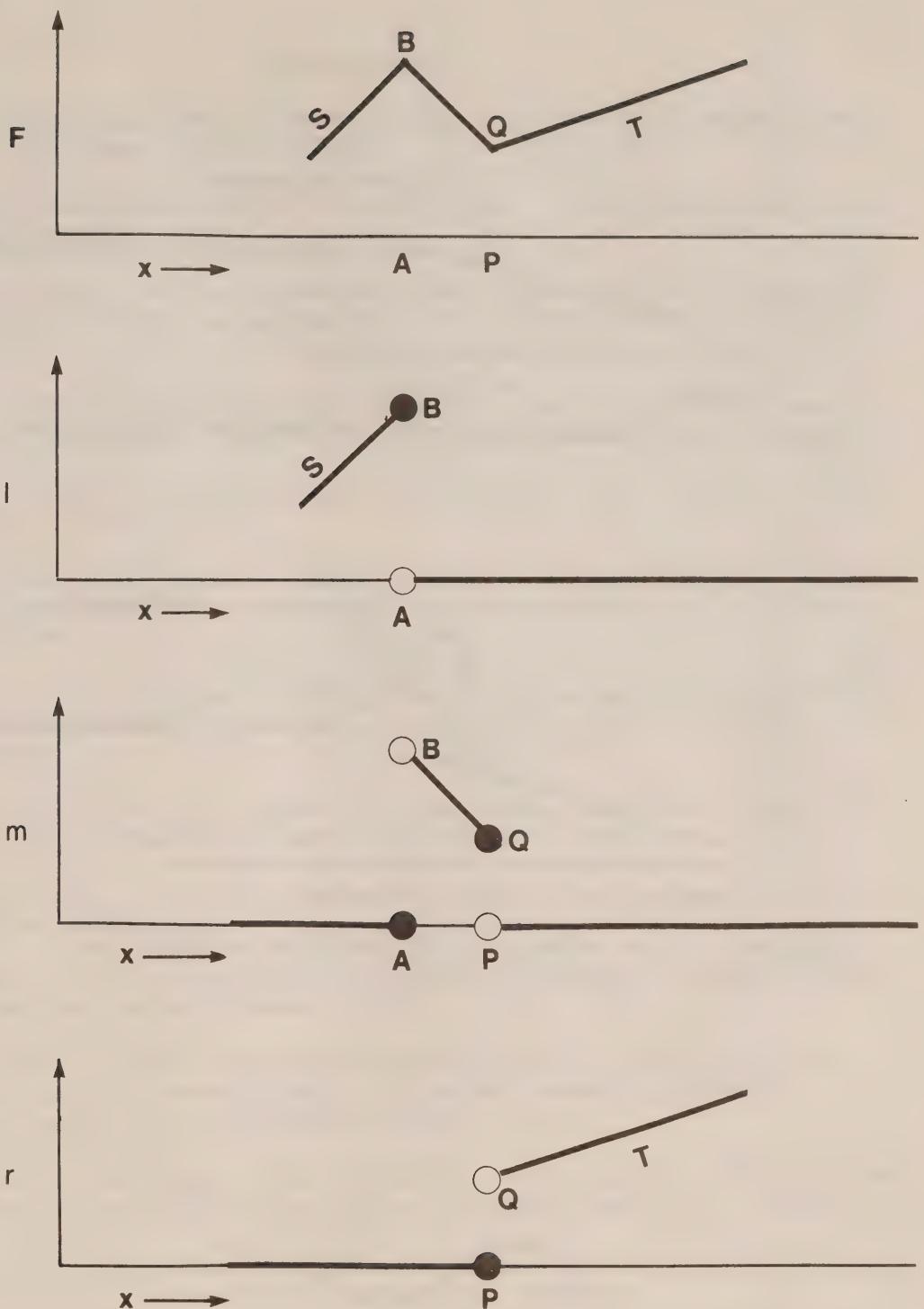


Figure 4. The function $F = f_l + f_m + f_r$

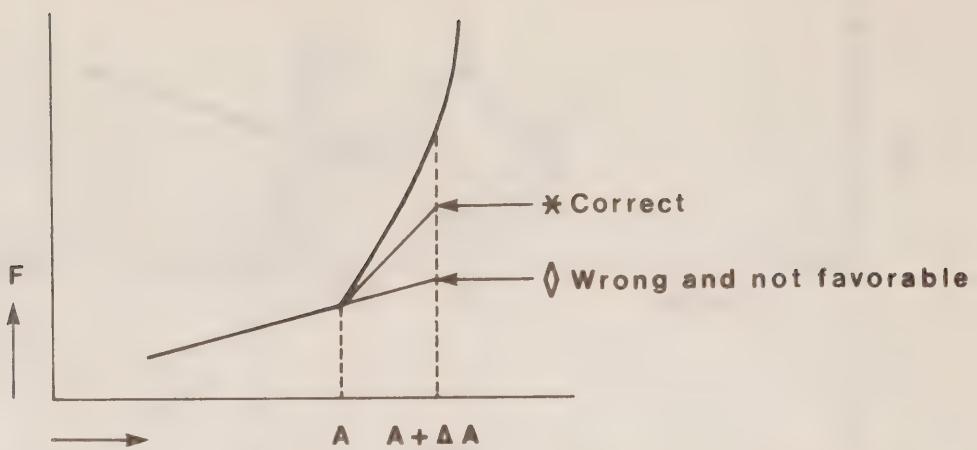


Figure 5. A wrong and not favourable prediction

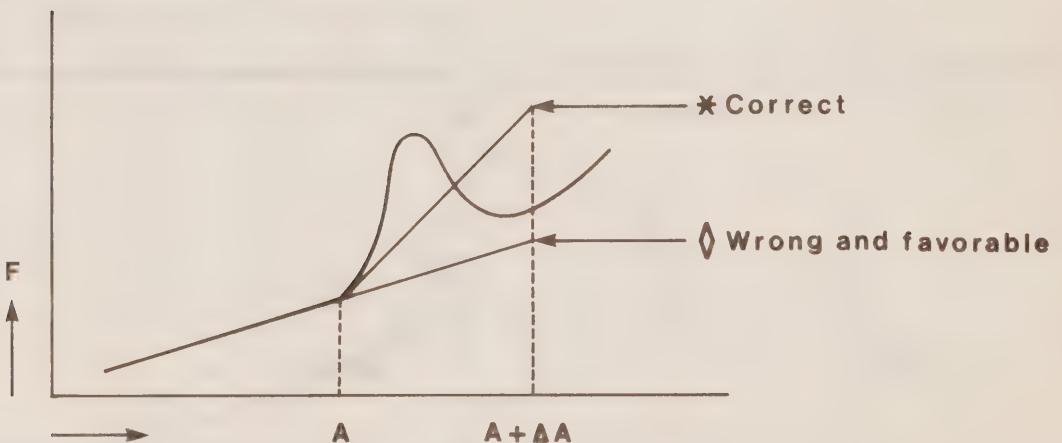


Figure 6. A wrong and favourable prediction

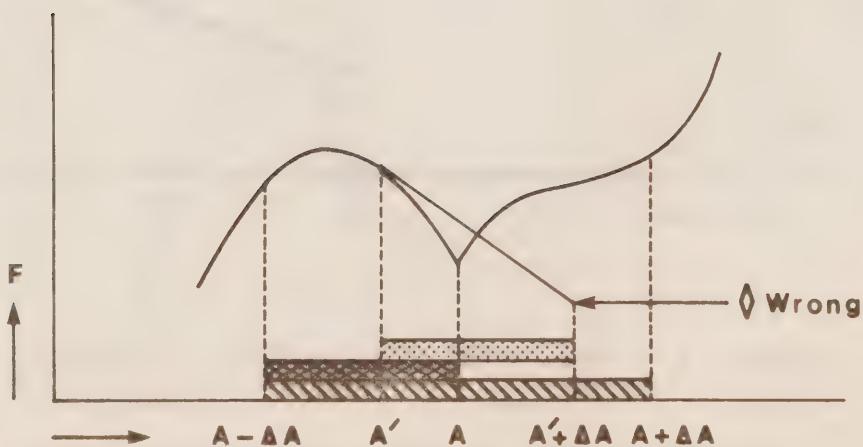


Figure 7. The neighborhood of a point of wrong prediction

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Appendix I

The Subroutine FSZ3LF and the program PROPL0.E

A) The Subroutine FSZ3LF.

1. Input Parameters:

RELACC: Relative Accuracy

NOPI: Number of permissible iterations

IWRITE=1 if the outcome of every iteration is required

EP: As input it contains the initial values in the order:

EP(2)=A, EP(3)=B, EP(4)=P, EP(5)=Q

NDP: Number of Data Points

X: The x coordinates of the NDP Points

Y: The y coordinates of the NDP Points

2. Output Parameters

EP; and, S,A,B,P,Q,T: in the correspondence:

EP(1)=S, EP(2)=A, EP(3)=B, EP(4)=P, EP(5)=Q, EP(6)=T

SSR: Sum of Squared Residuals of the fit

ISING: Type of singularity from subroutine LEQT1P of

IMSL Library (IMSL, 1979).

*: Return to this labelled statement if singularity occurs

3. The Subroutine FSZ3LF Needs the Following 6 Subroutines:

- a) LIFISS to compute the initial slope T
- b) FINKNO to find the point of intersection of two lines
- c) LERIND to find the index LINX of the closest point left to A and the index NINX of the closest point to the right of P
- d) FSZDER to prepare the coefficients of the normal equations. It contains the partial derivatives of F. The function F is contained in the following subroutine FUNCVA which is called by FSZDER.
- e) FUNCVA it computes the values of function F for each index I.
- f) LEQT1P it solves the systems of normal equations and it is given and described in the I.M.S. Library, (I.M.S.L., 1979).

4. The Subroutines FSZ3LF, LIFISS, FINKNO, LERIND, FSZDER, and FUNCVA:

JEPSSUB(1),FSZ3LF

```

C
SUBROUTINE FSZ3LF (RELACC,NOP1,IWRITE,EP,SSR,ISING,*)
DIMENSION EP(6),UJI(7),UC(15),CC(5),CP(6)
COMMON /DAP0/ NDP,X(1000),Y(1000)
COMMON /PAVA/ S,A,B,P,Q,T
COMMON /LRindx/ LINX,NINX

C
IF(IWRITE .EQ. 1) WRITE(6,664)
664 FORMAT(//,2X,'F. S. Z.. THREE LINE BEST LEAST SQUARES FIT',//,
T      5X,'DIFFERENTIAL CORRECTION METHOD.',//)
IF(IWRITE .EQ. 1) WRITE(6,666)
666 FORMAT(8X,'DATA POINTS: (XI,YI)',/,9X,'I',4X,'XI',5X,'YI',//)
IF(IWRITE .EQ. 1) WRITE(6,667) (I,X(I),Y(I),I=1,NDP)
667 FORMAT(1X,I9,2F7.2)

C
EP(1) = 0.0
CP(1) = 0.000
ISING = 0
KYKLOI = 0

C
*****1 KYKLOI = KYKLOI + 1
NPI = KYKLOI - 1
C
S = EP(1)
A = EP(2)
B = EP(3)
P = EP(4)
Q = EP(5)
T = EP(6)
IF(KYKLOI .NE. 1) GO TO 11
CALL LERIND(NDP,X,A,P,LINX,NINX)
CALL LIFISS(NINX,NDP,X,Y,AA,T,SSD)
EP(6) = T
BSA = B-S*A
QTP = Q-T*P
CALL FINKNO(BSA,S,QTP,T,TKX,TKY)
SM = (Q-B)/(P-A)
IF(IWRITE .EQ. 1) WRITE(6,16) A,B,P,Q,S,TKX,TKY,T,SM
16 FORMAT(3X,'INITIAL VALUES:',7X,'A=',13X,'B=',13X,'P=',13X,'Q=',
W   /,17X,4F15.9,/,2X,'REST OF IN.VAL.:',7X,'S=',13X,'TKX=',11X,
W   'TKY=',11X,'T=',/,17X,4F15.9,/,25X,'MIDDLE SLOPE: SM =',F15.9)
11 CONTINUE

C
IF(KYKLOI .GT. NOP1) GO TO 8
DO 2 K=1,5
CC(K) = 0.0
2 CONTINUE
DO 3 K=1,15
UC(K) = 0.0
3 CONTINUE

C
CALL LERIND(NDP,X,A,P,LINX,NINX)

C
SSR = 0.0
C
* * * * *

```

```

DO 4 I = 1,NDP
CALL FSZDER(KIND,I,DJI,SING,&992)
SSR = SSR + DJI(7)
KL = 0
DO 4 IR = 1,5
CC(IR) = CC(IR) + DJI(IR)*DJI(6)
DO 4 J = 1,IR
KL = KL + 1
UC(KL) = UC(KL) + DJI(IR)*DJI(J)
4 CONTINUE
C * * * * *
IF((IWRITE .EQ. 1).AND.(NPI .EQ. 0)) WRITE(6,46) SSR
46 FORMAT(2X,'INITIAL TOTAL SUM OF SQUARED DIFFERENCES= ',F15.9,/)
C
IF(NPI .EQ. 0) CSS = SSR
IF(CSS .LE. SSR) GO TO 47
COC = CRAM
CSS = SSR
IOI = NPI
DO 47 KT=1,5
CP(KT+1) = EP(KT+1)
47 CONTINUE
C
C ** ** ** ** ** ** ** ** ****
CALL LEQT1P(UC,1,5,CC,5,1DGT,DT1,DT2,IERT)
C ** ** ** ** ** ** ** ** ****
C
IF(IERT .NE. 0) GO TO 993
C
CRAM = 0.0000
DO 5 K=1,5
IF(EP(K+1) .EQ. 0.0) GO TO 5
CCRA = ABS(CC(K)/EP(K+1))
IF(CRAM .LT. CCRA) CRAM = CCRA
IF(CRAM .LT. RELACC) GO TO 9
5 CONTINUE
DO 6 K=1,5
EP(K+1) = EP(K+1) + CC(K)
6 CONTINUE
EP(1) = 0.0
C
IF(IWRITE .NE. 1) GO TO 7
WRITE(6,76) NPI,CRAM,SSR,KYKLOI,(EP(IKL),IKL=1,6)
76 FORMAT(2X,'ITER.NO:',J3,' MAX.OF REL.ACC. COEF. CORR. = ',F15.9,
      R ' TOTAL SUM OF S.R. = ',F15.9,/,2X,'ITER.NO:',J3,2X,0F15.9)
7 CONTINUE
C
GO TO 1
C ****
C
8 CONTINUE
WRITE(6,81)
81 FORMAT(20X,'NUMBER OF PERMISSIBLE ITERATIONS EXHAUSTED')
SSR = CSS
NOPI = IOI
RELACC = COC
S = CP(1)

```

```

A = CP(2)
B = CP(3)
P = CP(4)
Q = CP(5)
T = CP(6)
DO 811 KT=1,5
EP(KT+1) = CP(KT+1)
811 CONTINUE
BSA = B-S*A
QTP = Q-T*P
CALL FINKNO(BSA,S,QTP,T,TKX,TKY)
SM = (Q-B)/(P-A)
IF(IWRITE .EQ. 1) WRITE(6,82) S,A,B,P,Q,T,SM,TKX,TKY,CRAM,SSR
82 FORMAT(1X,'ESTIMATED VALUES:',7X,'S=',13X,'A=',13X,'B=',13X,'P=',13X,'Q=',13X,'T=',/,17X,6F15.9,/,2X,'REST OF IN.VAL.:',7X,Z,'SM,TKX,TKY: ',3F15.9,' MORACC=',F15.9,' SSR = ',F15.9,/)
GO TO 999
C
9 CONTINUE
RELACC = CRAM
NOPI = KYKLOI - 1
IF(IWRITE .EQ.1) WRITE(6,91) NOPI
91 FORMAT(//,20X,'***** NORMAL RETURN !! SOLUTION IN',I5,
S ' FULL ITERATIONS *****','')
BSA = B-S*A
QTP = Q-T*P
CALL FINKNO(BSA,S,QTP,T,TKX,TKY)
SM = (Q-B)/(P-A)
IF(IWRITE .EQ. 1) WRITE(6,82) S,A,B,P,Q,T,SM,TKX,TKY,CRAM,SSR
GO TO 999
C
992 CONTINUE
ISING = 2
NOPI = KYKLOI
WRITE(6,69) ISING,NOPI
WRITE (6,692) SING
692 FORMAT(1X,'SINGULARITY AT A=P= ',F15.9)
RETURN 1
993 CONTINUE
ISING = 3
NOPI = KYKLOI
WRITE(6,69) ISING,NOPI
69 FORMAT(/,10X,'SINGULARITY NO: ',I2,' AT ITERATION : ',I3,'***')
RETURN 1
C
999 CONTINUE
RETURN
END

```

JEPSUB(1),LIFISS

```

C
C
      SUBROUTINE LIFISS(IA,IT,X,Y,A,BX,SSD)
      DIMENSION X(2),Y(2)
C
      AX=0.0
      AY=0.0
      AXX=0.0
      AXY=0.0
      AYY=0.0
      N=IT-IA+1
      DO 1,I=IA,IT
      AX=AX+X(I)
      AY=AY+Y(I)
      AXX=AXX+X(I)*X(I)
      AXY=AXY+X(I)*Y(I)
      AYY=AYY+Y(I)*Y(I)
1    CONTINUE
      XM=AX/N
      YM=AY/N
      SXX=AXX-(AX*AX)/N
      SXY=AXY-(AX*AY)/N
      SYY=AYY-(AY*AY)/N
      IF(SXX .EQ. 0.000) GO TO 2
      BX=SXY/SXX
      A=YM-BX*XM
C
      SSD=SYY-BX*SXY
C
      GO TO 3
C
2    BX = 1.0E25
      SSD = 0.000
      A = XM
C
3    CONTINUE
      RETURN
      END
C

```

JEPSUB(1),FINKNO

```
C      SUBROUTINE FINKNO(A1,B1,A2,B2,XK,YK)
C
DD = B1 - B2
IF(DD .EQ. 0.00) GO TO 1
C
IF((A1 .LT. 1.0E23) .AND. (B1 .LT. 1.0E23)) GO TO 11
XK = A1
YK = A2 + B2*XK
GO TO 2
11 IF((A2 .LT. 1.0E23) .AND. (B2 .LT. 1.0E23)) GO TO 12
XK = A2
YK = A1 + B1*XK
GO TO 2
12 CONTINUE
C
DN = A2 - A1
XK = DN/DD
YK = A1 + B1*XK
GO TO 2
1 XK = 1.0E25
YK = 1.0E25
2 CONTINUE
RETURN
END
```

```
JEPSON(1)•LERINI.  
C  
SUBROUTINE LERINI(NDP,X,A,P,LINX,NINX)  
DIMENSION X(2)  
C  
LINX = 0  
NINX = 0  
DO 1 I=1,NDP  
XX = X(I)  
IF(XX .LE. A) LINX = I  
IF(XX .GT. P) GO TO 2  
1 CONTINUE  
2 NINX = I  
CONTINUE  
RETURN  
END
```

JEPSUB(1)•FSZDER

```

C
      SUBROUTINE FSZDER(KIND,I,DJI,SING,*)
COMMON /DAP0/ NDP,X(1000),Y(1000)
COMMON /PAVA/ S,A,B,P,Q,T
COMMON /LRINDEX/ LINX,NINX
DIMENSION DJI(7)

C
      SING = 0.000000000
      XX = X(I)
      YY = Y(I)
      XMA = XX-A
      XMP = XX-P
      CALL FUNCVA(1,FVA)
      DJI(6) = YY - FVA
      DJI(7) = DJI(6)*DJI(6)

C
C
      IF(I .GT. LINX) GO TO 2
      DJI(1) = 0.0
      DJI(2) = 1.0
      DJI(3) = 0.00
      DJI(4) = 0.00
      DJI(5) = 0.00
      GO TO 9

C
      2  IF(I .GE. NINX) GO TO 3
      PMA = P-A
      IF(P .NE. A) GO TO 99
      SING = A
      RETURN 1

      99 CONTINUE
      QMB = Q-B
      PMAS = PMA*PMAS
      DJI(1) = QMB*XMP/PMAS
      DJI(2) = -XMP/PMA
      DJI(3) = -QMB*XMA/PMAS
      DJI(4) = XMA/PMA
      DJI(5) = 0.00
      GO TO 9

C
      3  CONTINUE
C
      DJI(1) = 0.00
      DJI(2) = 0.00
      DJI(3) = -T
      DJI(4) = 1.0
      DJI(5) = XMP

      9  CONTINUE

C
      RETURN
      END

```

```
JEPSUB(1),FUNCVA
```

```
C
SUBROUTINE FUNCVA(I,FI)
COMMON /DAPO/ NDP,X(1000),Y(1000)
COMMON /PAVA/ S,A,R,P,Q,T
C
XX = X(I)
IF(XX .GT. A) GO TO 2
IF(S .EQ. 0.000) GO TO 8
FI = S*(XX-A) + B
GO TO 9
2 IF(XX .GT. P) GO TO 3
FI = ((Q-B)*XX + B*P-A*Q)/(P-A)
GO TO 9
3 FI = T*(XX-P) + Q
GO TO 9
8 FI = B
9 CONTINUE
RETURN
END
```

B. About the parameters of the program PROPL0.E

1. Sequential input cards:

- a) PESDE: A station of a depth less than PESDE metres will be ignored.
- b) LOPT: For linear depth scale, LOPT must be zero.
DEPMX: The depth in metres below which the profiles are truncated.
It also controls the divisions of y axis, and as such it is preferable to be a multiplier of 8.
DSM: main despiking parameter
- c) IPLOVA: Index of desired variable:
4 for temperature, 5 for sigma-t.
TITLE1, TITLE2: two lines of 40 characters each, below the assumed x axis.
- d) SCL: scale: 1 inch on the actual plot paper corresponds to 1/SCL.
OFST: x coordinate of y axis.
SEP: Actual distance, in inches, separating the curves equals SEP*SCL.
CAL: Value of reference for each curve. A cross is plotted 0.1 inches below the assumed X axis.
DESPI: Despiking distance in inches. This local despiking parameter is activated for depths greater than DEPDE.
DEPDE: The depth below which DFSPI is activated.
- e) NANSW: put .FALSE. for one set of curves.

2. The Header A, the number of data points (NDP), and the data for depth, temperature, salinity and sigma-t are read from a stored file assigned to unit 9. The rest of the needed parameters have been set internally to proper values.

3. Note that the program PROPL0.E has been based on an older program LOLI.P (Logarithmic or Linear Profile Plot) and could be further optimized. Also note that the above despiking measures as coming from LOLI.P are related to the plot only.

4. The output of the program, via unit 8, consists of a file containing the number of processed stations, the header, and the estimated depth of the WML for each station.

5. Comments

- a) In subroutine FSZ3LF the statements for the optional printing of the values of each iteration could be arranged in a better way.
- b) The variable: KIND in subroutine FSZDER is not in use.

Appendix II

ExamplesA. Our first example of the SENT method

1) The following data were introduced to the Elliott 603 computer on the 2nd of October, 1969

<u>i</u>	<u>X_i</u>	<u>Y_i</u>	<u>i</u>	<u>X_i</u>	<u>Y_i</u>	<u>i</u>	<u>X_i</u>	<u>Y_i</u>
1	6	3	11	13	21	21	22	9
2	7	4	11	14	19	22	22	12
3	8	6	13	14	20	23	24	13
4	8	8	14	14	21	24	25	15
5	10	11	15	15	18	25	27	15
6	10	13	16	16	17	26	28	15
7	11	14	17	17	16	27	30	17
8	11	17	18	18	14	28	31	18
9	13	18	19	20	12	29	32	20
10	13	20	20	21	11	30	34	22

2) The performed iterations are given below:

Iteration: 0 (initial values)

$$S = 2.3295019$$

$$A = 12.545455$$

$$P = 20.636364$$

$$B = 17.454545$$

$$Q = 13.818182$$

Iteration: 1

$$S = 2.5929649$$

$$A = 13.221812$$

$$P = 22.418355$$

$$T = .84049359$$

$$B = 20.592937$$

$$Q = 10.647487$$

$$SSR = 691.79370690$$

Iteration: 2

$$S = 2.5161291$$

$$A = 13.274556$$

$$P = 21.342886$$

$$T = .82326950$$

$$B = 20.515986$$

$$Q = 10.655516$$

$$SSR = 55.20667952$$

Iteration: 3

S = 2.5161290	B = 20.650312
A = 13.329553	Q = 10.221360
P = 21.333232	SSR = 30.27467436
T = .87227415	

Iteration: 4

S = 2.5161291	B = 20.647404
A = 13.328297	Q = 10.221388
P = 21.333805	SSR = 28.61537273
T = .87227415	

Iteration: 5

S = 2.5161290	B = 20.647404
A = 13.328397	Q = 10.221388
P = 21.333805	SSR = 28.61527133
T = .87227414	

Iteration: 6

S = 2.5161290	B = 20.647404
A = 13.328397	Q = 10.221388
P = 21.333805	SSR = 28.61527018
T = .87227415	

Iteration: 7 (solution)

S* = 2.5161291	B* = 20.647404
A* = 13.328397	Q* = 10.221388
P* = 21.333805	SSR* = 28.61527075
T* = .87227414	

Iteration: 8

S = 2.5161290	B = 20.647404
A = 13.328297	Q = 10.221388
P = 21.333805	SSR = 28.61527075
T = .87227415	

3) The graph of the data points, and of the achieved three lines in iteration 7, are given in Fig. 8.

B. Some other examples.

1) Part of the temperature profiles from cruise:

C.O.D.E.: 79-12 (May 1979) are given in Fig. 9.

2) The data for Fig. 10 were taken from Carmack (1973; and personal communication). In his work, Carmack attempted to define the near bottom

structure adjacent to the Antarctic continent using a SiO_3 versus Θ correlation diagram. Here, we use the SENT method in order to subdivide the cluster of the data into three optimum subclusters, structured as continuous line segments. This case was discussed in part 6.

- 3) The data for the eight temperature profiles of part a), Fig. 11, come from Lake Erie and were given by Lam (1981). In the last profile the method fails and indicates a depth of 8 m, in which the first significant deviation from the first "transient mixed layer" occurs. In part b of Fig. 11, the same data have been treated combinatorially for the unconstrained case: $S \neq 0$, which represents a more general 3-layered description of the lake. For a comparison, the respective "corners" in both parts of Fig. 11 have been joined by linear segments. These results compare satisfactorily with those obtained manually (Lam, 1981).
- 4) Better agreement between the manually obtained and the computer output can be achieved if instead of the difference $F - Y_i$ we take the distance d_i of the points from the function. The result will be a form of central axis of inertia which most probably the human eye follows. In addition, by taking the normals to the curve, the problem of having during the measurements both parameters X_i and Y_i in error is also taken into account. The basis of this idea could be attributed to K. Pearson (1901) and it is 80 years old.

If, however, the ratio of the unit lengths of the two axes changes, the normality is not preserved. But then, we suggest that even for the human eye, this constitutes a new picture. Thus, a new fit, or, any other computation of the corresponding transformations is fully justified.

The program JEPPOP.H based on the combinatorial subroutine CACOTL already realizes the above. The results of application of this program are expected to be published soon.

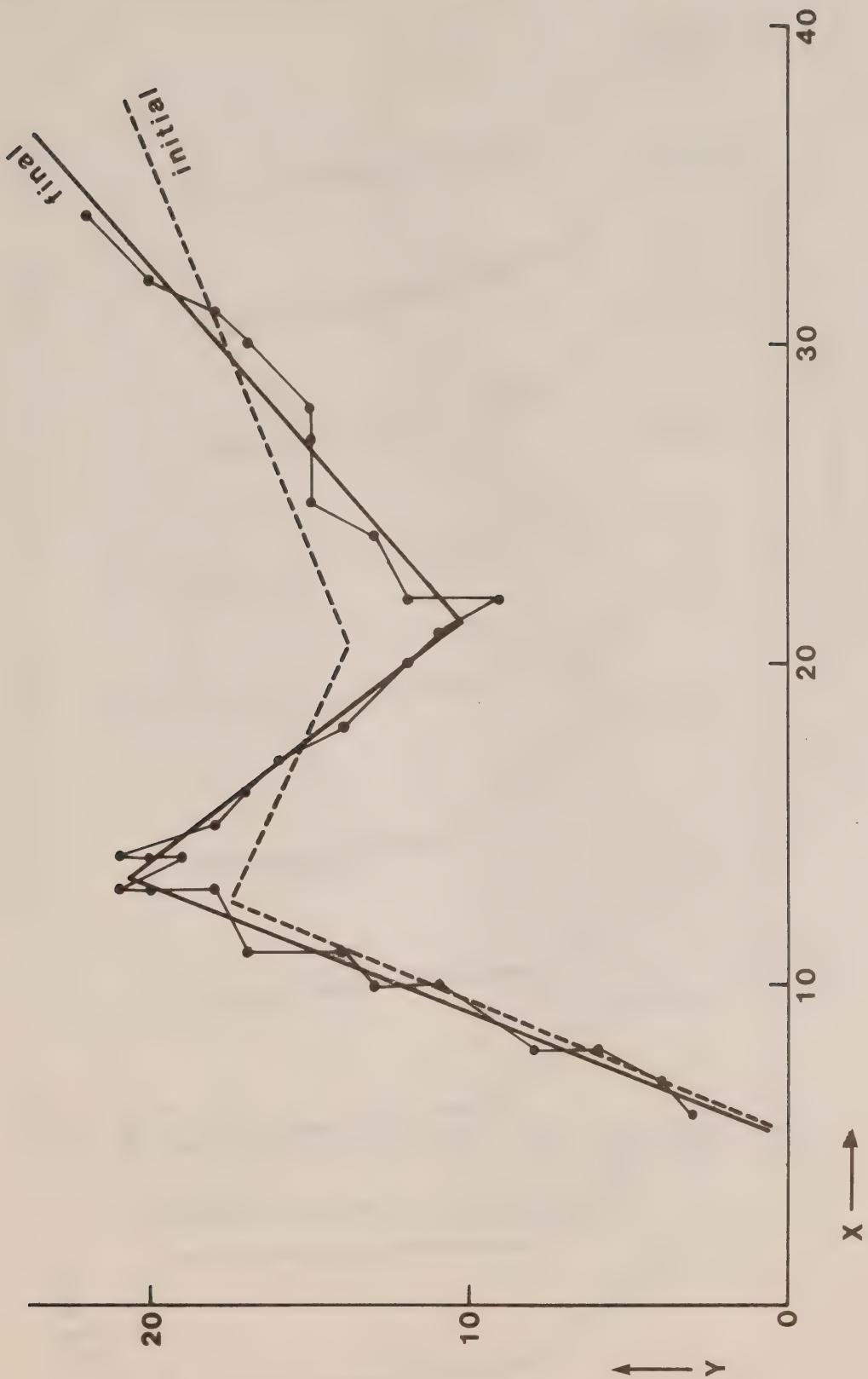


Figure 8. Our first example

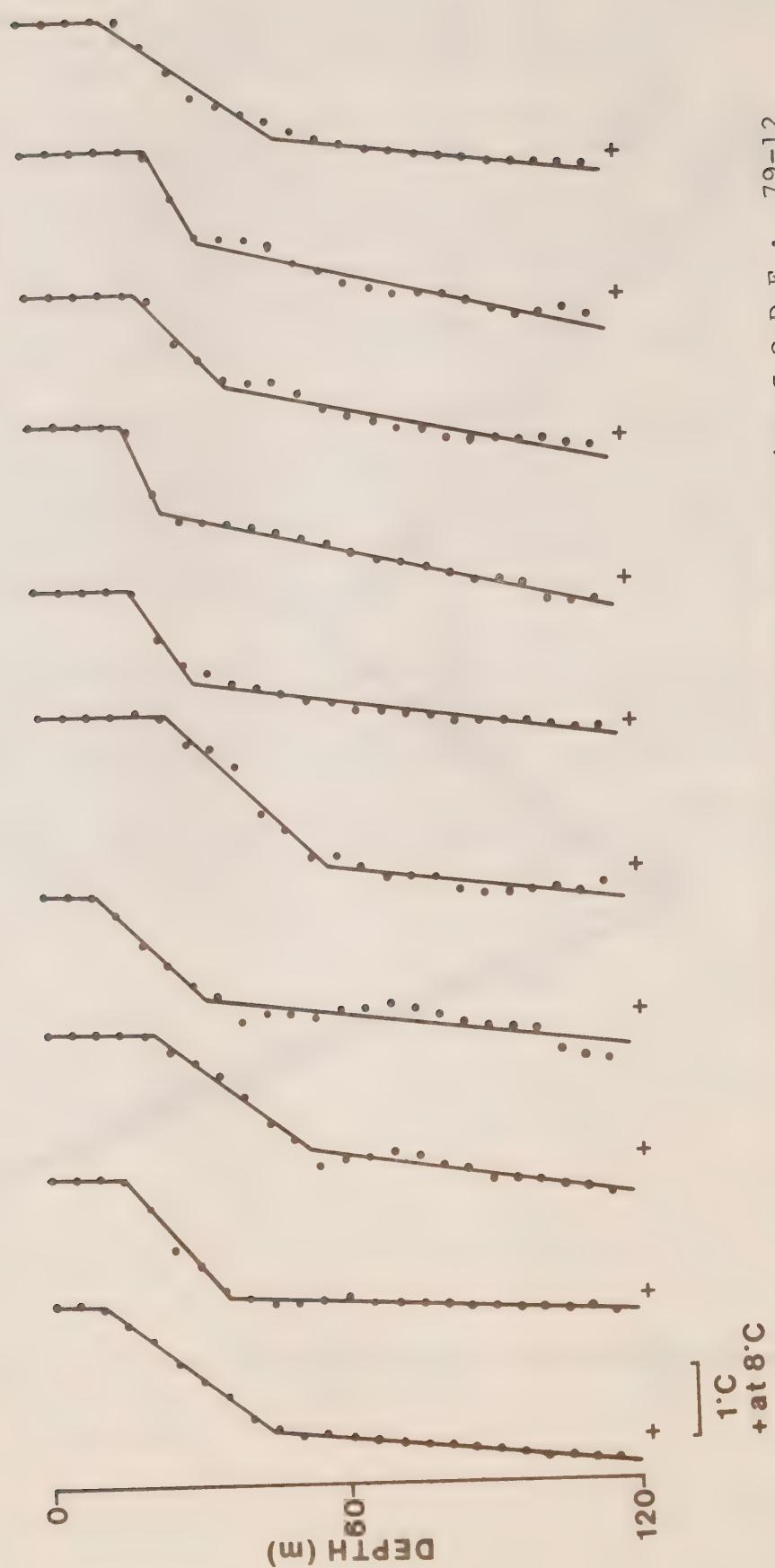


Figure 9. Temperature profiles from cruise C.O.D.E.: 79-12

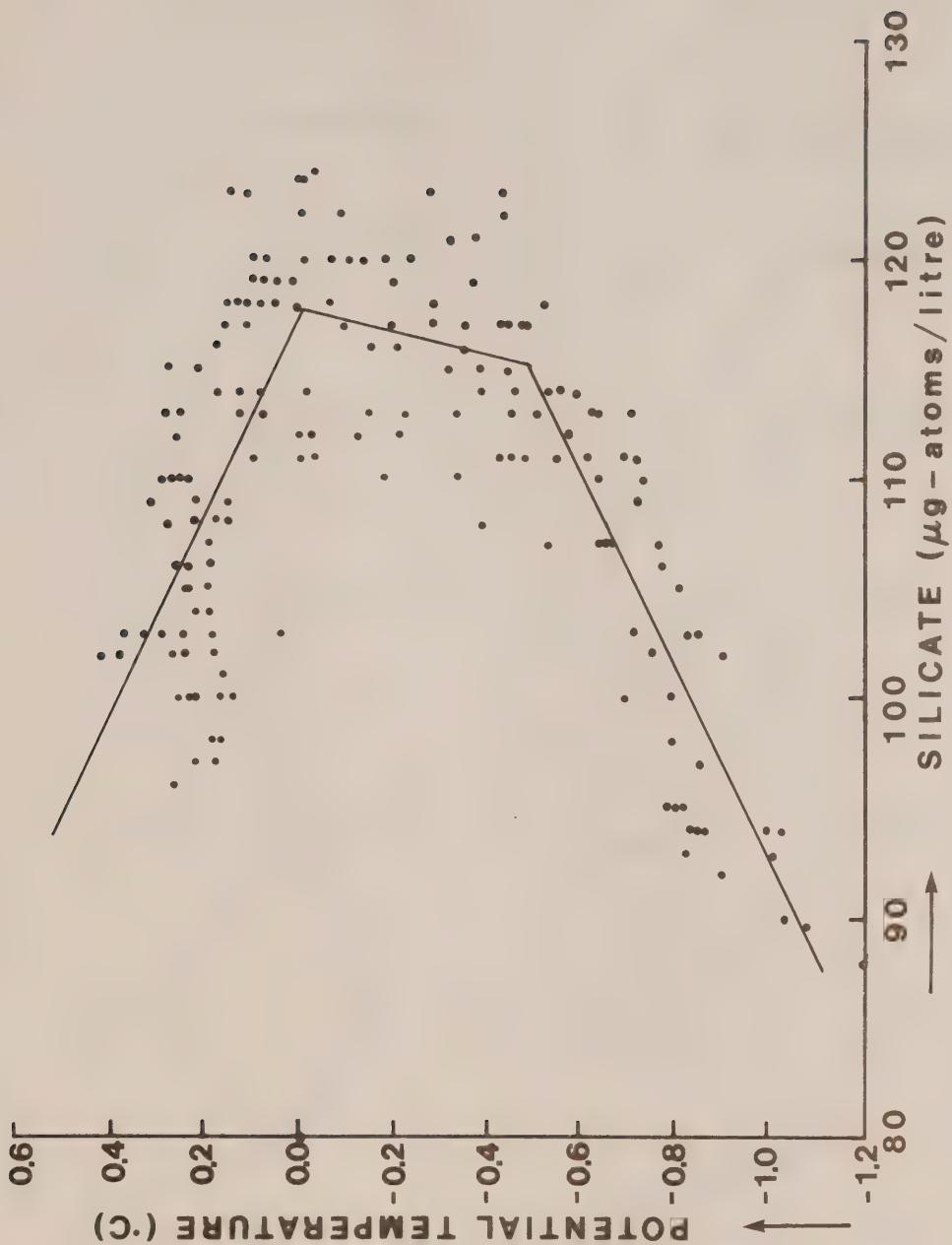


Figure 10. A potential temperature versus SiO_3 from Weddell Sea

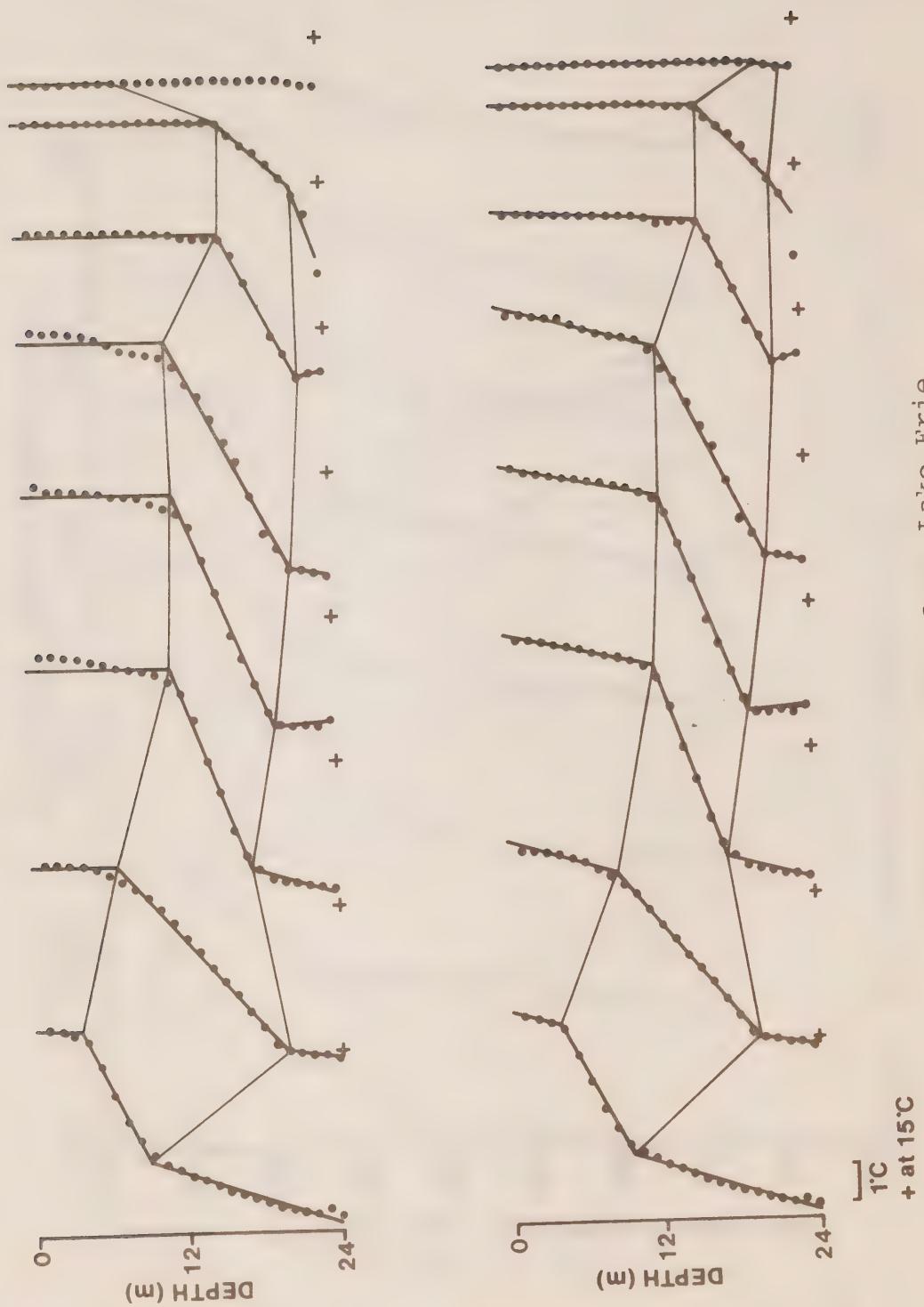


Figure 11. Data from Lake Erie

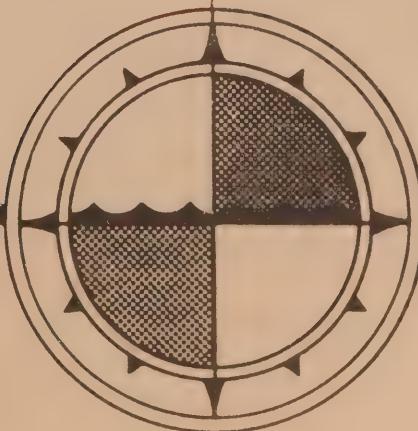
**AN ANALYSIS OF WIND AND CURRENT OBSERVATIONS
COLLECTED IN THE QUEEN CHARLOTTE SOUND -
HECATE STRAIT - DIXON ENTRANCE REGION
DURING 1954 and 1955**

by

Richard E. Thomson NOV 16 1981



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Abstract

Drogue and Ekman current meter records collected in the Queen Charlotte Sound - Hecate Strait - Dixon Entrance region during 1954 and 1955 are presented. An analysis of these data shows that both the mean and tidal currents possessed considerable vertical structure. Tidal currents were dominated by the semi-diurnal constituent which was strongly affected by bathymetry. Maximum average speeds were of order 30 cm/s while tidal streams exceeded 50 cm/s over the shallow banks east of the Queen Charlotte Islands.

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1. Introduction

During the summers of 1954 and 1955 the now-defunct Pacific Oceanographic Group of the Fisheries Research Board of Canada at Nanaimo conducted a series of physical oceanographic sampling programs within the Queen Charlotte Sound-Hecate Strait - Dixon Entrance region. Included in the surveys were a number of fixed anchor stations where current measurements were obtained over durations of roughly two tidal cycles (Fig. 1). These current records are among the earliest collected on the British Columbia coast and the first obtained over the continental shelf. However, aside from progressive vector diagrams in Barber and Groll (1955), Barber (1957) and Dodimead (1980), no analysis of these data has yet been published. This is unfortunate since, in addition to their historical significance, the records provide a noteworthy contribution to present direct current observations within the inner shelf region and are the only data to allow delineation of the vertical current shear.

The purpose of this report is to describe certain aspects of the circulation within the inner shelf region based on the 1954 - 1955 current observations. Attention is given primarily to the mean currents and tidal currents with particular emphasis on the vertical structure. Owing to the short durations and limited spatial coverage of the current stations, results provide a basic insight only into the flow structure within the region. It becomes obvious when working with data of this type, that many recent advances in our understanding of oceanic processes would not have taken place without the advent of the modern in situ current meter.

2. Data collection and analysis

The data set

The currents were measured at standard hydrographic depths from an anchored ship via Ekman current meters (Ekman, 1932) and crossed-vane surface drogues. Drogue measurements were limited to the upper 20 m depth while Ekman current meter measurements were taken to depths of up to 200 m (Table 1).

Each anchor station was typically two tidal cycles (50 h) in length with current meter observations every hour or half-hour at standard hydrographic depths; for obvious reasons, data sets shorter than one tidal cycle will not be considered here. Drogue measurements were usually obtained more frequently than the current meter measurements but often contained intermittent record gaps of up to a few hours. (As the results indicate, the low accuracy of these data made it sometimes impossible to properly resolve the diurnal and semidiurnal tidal current constituents using the drogue observations.) In general, currents at the surface were from drift drogue measurements, those below this from current meter measurements. (The former were actually an average over the top $\frac{1}{2}$ metre corresponding to the length of the drogue.)

The Ekman meters were lowered to a specified standard hydrographic depth, triggered, then allowed two to three minutes timed-operation before being stopped by a second messenger. A current meter profile from 10 to 100 m typically took about 30 minutes; similar times were required for deeper profiles as a result of omitting observations at one or more standard depths. The current drag

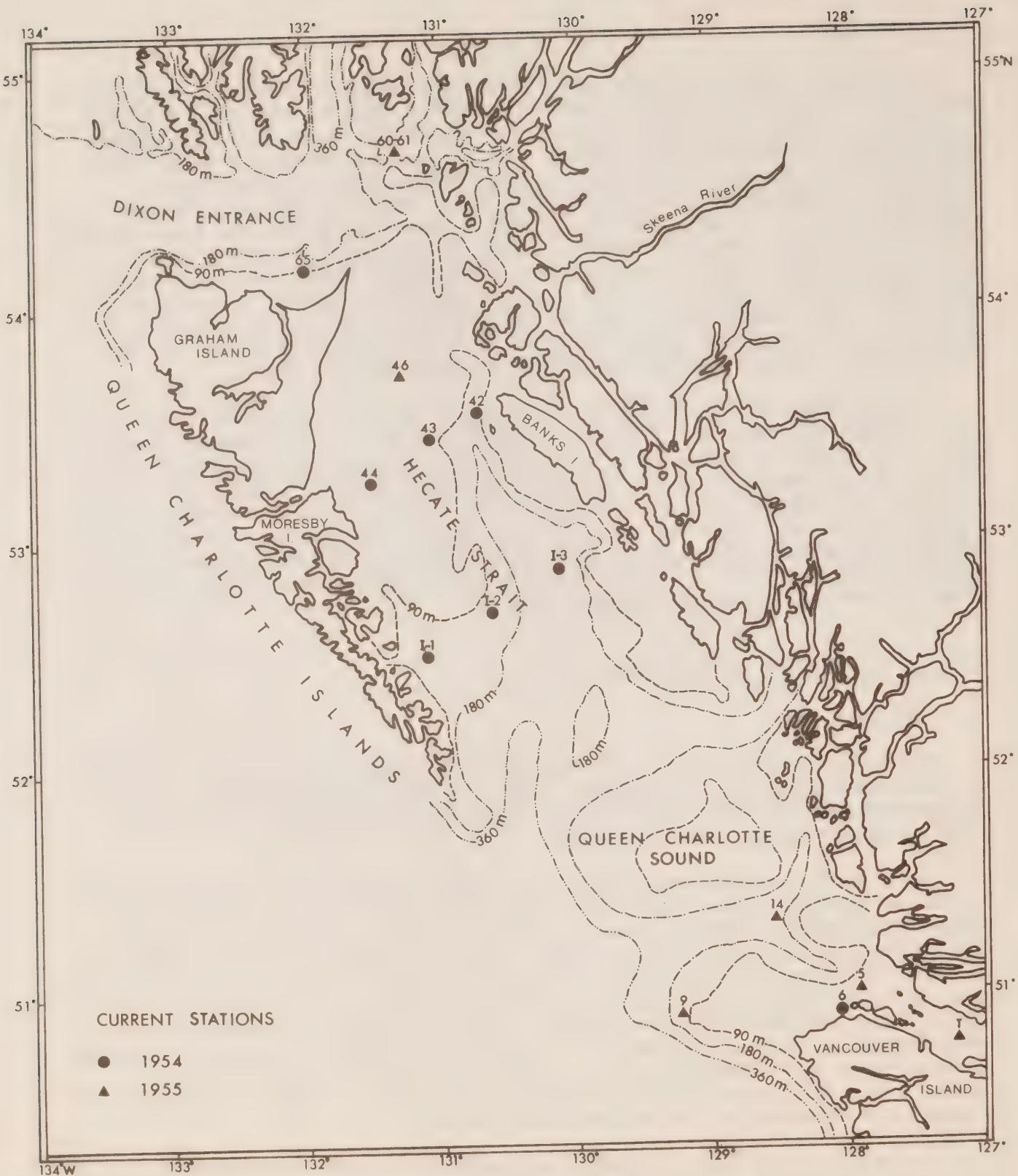


Table 1. Locations, times and depths of current and drogue measurements during 1954-1955 surveys. Last column identifies ship:

C = H.M.C.S. Cedarwood; E= C.N.A.V. Ehkoli; and P = C.G.M.V. Parry

STATION	POSITION		TIME (PST)	DEPTHs (m)		WATER DEPTH (m)	SHIP
	LAT	LONG		DROGUES	METERS		
44	53° 15.5'	131° 30.3'	0935 May 19 to 1129 May 21, 1954	0,5,10	10,17	20	C
43	53° 26.6'	131° 04.2'	1524 May 21 to 1658 May 23, 1954	0,10,20	10,20,30 50	60	C
42	53° 36.3'	130° 43.8'	2114 May 23 to 2138 May 25, 1954	0,10	20,30,50 100,150	183	C
65	54° 10.5'	132° 00.0'	0515 July 17 to 1140 July 19, 1954	0	10,20,30 50, 75	80	E
I-3	52° 53.0'	130° 08.0'	1931 August 30 to 2158 Sept.1, 1954	0	10,20,50 100,200	234	C
I-2	52° 40.0'	130° 40.0'	0130 Sept.2 to 0446 Sept.4, 1954	0	10,20,30 50, 100	137	C
I-1	52° 31.2'	131° 07.7'	1130 Sept.4 to 1440 Sept.6, 1954	0	10,20,30 50, 75	88	C
6	50° 54.7'	128° 04.6'	0815 Sept.7 to 2224 Sept.7, 1954	0	10,20,25	29	C
9	50° 55.7'	129° 06.0'	0806 June 1 to 0719 June 3 ,1955	0	10,20,30 50, 75	84	C
14	51° 19.7'	128° 27.0'	0830 June 4 to 0844 June 5, 1955	0	10,20,30 50,75	124	C
5	51° 01.5'	127° 54.8'	1406 June 6 to 1640 June 8, 1955	0	10,20,30,50 75,100,120	132	C
T	50° 49.5'	127° 15.8'	1446 June 6 to 1534 June 8, 1955	-	10,20,30, 50	60	P

Current records from stations 46 and 60-61 were less than 12 hours' duration.

observations were made via a crossed metal vane buoyed up with four-inch glass balls; each face of the vane had an area of 0.139 m^2 . Thirty metres of stray line was payed out and the current speed measured over 30 to 50 m of line depending on the strength of the current. Hourly wind observations taken onboard H.M.C.S. Cedarwood were from a height of 14 m above the waterline; those from C.N.A.V. Ehkoli and C.G.M.V. Parry were taken using a hand-held indicator at deck level.

The wind and current data obtained during the 1954 and 1955 surveys are tabulated in two manuscript reports published by the Joint Committee on Oceanography in 1955 (Pacific Oceanographic Group, 1955a; 1955b). An example of the tabulated data is presented in Table 2.

Methods of analysis

To facilitate processing of the current and wind observations, the tabulated data were first key-punched onto cards then read onto 9-track tape. Each file contains the time (P.S.T.), depth (m), speed (cm/s) and direction ($^{\circ}$ T) of the current velocity vector at a given location. For the winds, speeds are in m/s and direction is toward which the wind is blowing (i.e. all vectors use oceanic convention). A second set of files contains hourly, linearly interpolated data derived from the raw data.

A harmonic analysis program based on a least squares fitting technique (Foreman, 1975) was used to extract the mean (dc), diurnal and semidiurnal tidal current constituents from the original current records. Owing to the brevity of the observations, the derived time-varying quantities represent the "instantaneous" resultant values for species 1 and 2 tidal currents; it is assumed that these were dominated by the K_1 and M_2 constituents having effective frequencies of approximately 0.04 and 0.08 cph*, respectively. The program determines the magnitudes of the major and minor axes of the diurnal and semi-diurnal tidal current ellipses, the orientation of the major axes measured counterclockwise from east, and the phase lag, $g(^{\circ})$, of the constituent relative to 120° west longitude. Following the harmonic analysis, residual current records were obtained by subtracting the combined mean-tidal current constituents from the original data on a point-for-point basis. The percentage of current variance accounted for by the tidal current motions has also been determined.

The vertical phase lags between all pairs of depths for both east-west and north-south components have been determined using the hourly interpolated raw data records. Lags are at hourly increments to a maximum of ± 13 hours. However, because the currents are dominated by the tidal signal, the degree of current rotation with depth resembles that obtained from the ellipse presentation. Consequently, lag correlation results presented here will be confined to a comparison of a subsurface current meter record (usually 20 or 30 m depth) with those from shallower and deeper depths. Lag correlations at four locations only are presented. Lastly, the vector mean winds, the mean wind speeds regardless of direction and the wind variances have been determined for the duration of the current records.

* cph = cycles per hour.

Table 2. Example of original data listing. (From Data Record, Current Measurements, Hecate Project 1954, File N6-4, 1955).

EKMAN CURRENT METER OBSERVATIONS				CURRENT DRAG OBSERVATIONS			
Station No. 43							
Time P.S.T.	Depth (m)	Speed (cm/sec)	Dir. (°T)	Time P.S.T.	Depth (m)	Speed (cm/sec)	Dir. (°T)
Wind							
1524-21-V	50	15	257				
1529	30	9	347				
1534	20	23	340				
1538	10	21	337				
1546	50	10	217				
1551	30	6	327				
1556	20	17	314	1556-21-V	0	40	344
1600	10	20	017	1607	10	32	342
				1617	20	41	027
1624	50	16	142				
1630	30	10	197				
1636	20	9	257				
1640	10	17	045				
				1638	0	37	307
1648	50	20	141	1649	10	18	007
1654	30	12	147	1709	20	19	080
1700	20	6	117				
1704	10	17	035				
1722	50	21	160				
1726	30	11	157				
1730	20	17	124				
1733	10	18	077				
1752	50	25	157				
1758	30	17	157				
1802	20	23	129				
1805	10	22	067	1805	0	23	057
				1810	10	24	077
1822	50	30	159	1823	20	26	107
1826	30	21	132				
1830	20	28	117				
1833	10	32	079				
1851	50	34	157				
1856	30	24	137				
1859	20	27	133				
1902	10	26	102	1900	0	29	094
				1910	10	21	112
1922	50	33	162	1915	20	22	127
1926	30	21	120				
1929	20	31	145				
1933	10	31	090				

3. Results

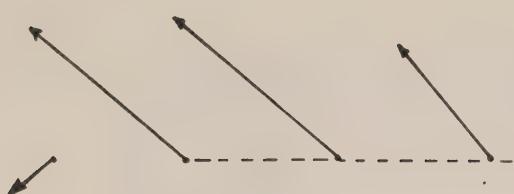
In this section, the major features of the currents are presented based on the wind and current records tabulated in the Appendices.

Mean Currents

The mean (time-averaged) currents at each depth and station are plotted in Figures 2a,b (a listing of these data is given in Appendix B1). Vector averaged winds for the duration of the current observations are plotted above the currents (wind scale = current scale x 100). The main features of the mean flow were as follows.

1. At all locations there was considerable variation in current speed and direction with depth. Mean speeds in excess of 25 cm/s were measured at near-surface depths at cross-channel locations I-1 to I-3 during early September 1954 and at Station 5 in June 1955.
2. Local winds appeared to be a significant, though not overriding, factor in determining the mean surface flows. This is not surprising in that the integrated, large-scale wind effect prior to the current observations would presumably have been of greater importance than winds measured during the observations. Winds were possibly responsible for the difference in the currents at 0 and 10 m compared to greater depths at stations 65 and 43. Winds may have also affected the north-south variation in the near-surface currents at stations I-1 to I-3. On the other hand, the weak mean currents over the shallow region of station 44 were not consistent with the presence of a comparatively strong (12 m/s) average wind at the time.
3. The single station (65) in Dixon Entrance (McIntyre Bay) possessed a strongly sheared current with onshore flow near the bottom. Onshore bottom flow in this region has also been recently observed using bottom drifters (J. Harper, personal communication).
4. The cross-channel stations 42-44 occupied in late May 1954 indicated negligible mean flow over the broad shallow bank adjacent to the east coast of Graham Island. However the flow strengthened within the deeper waters off the bank where it was directed predominantly southward.
5. There was a sharp decrease in mean speed below 20 m depth at cross-channel stations I-1 to I-3. This was accompanied, at stations I-1 and I-3, by a change in direction. The near-surface flow at I-2 was southeastward parallel to the axis of Hecate Strait whereas at I-1 and I-3 there was a definite cross-strait flow to the northeast.
6. The currents taken during the first week in June, 1955, (stations 5, 9, 14) in southern Queen Charlotte Sound indicated the presence of a strong (10-20 cm/s) near-surface and near-bottom mean flow with a relative minimum velocity around mid-depth. Except for the outer location (9) there was also a change in direction with depth. This was most pronounced at station 5 north of Gordon Channel.

9



I-3

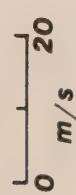
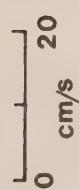


I-2



I-1

42



WIND

0 + Metres

10 +

20 +

30 +

50 +

75 +

65

100 +

150 +

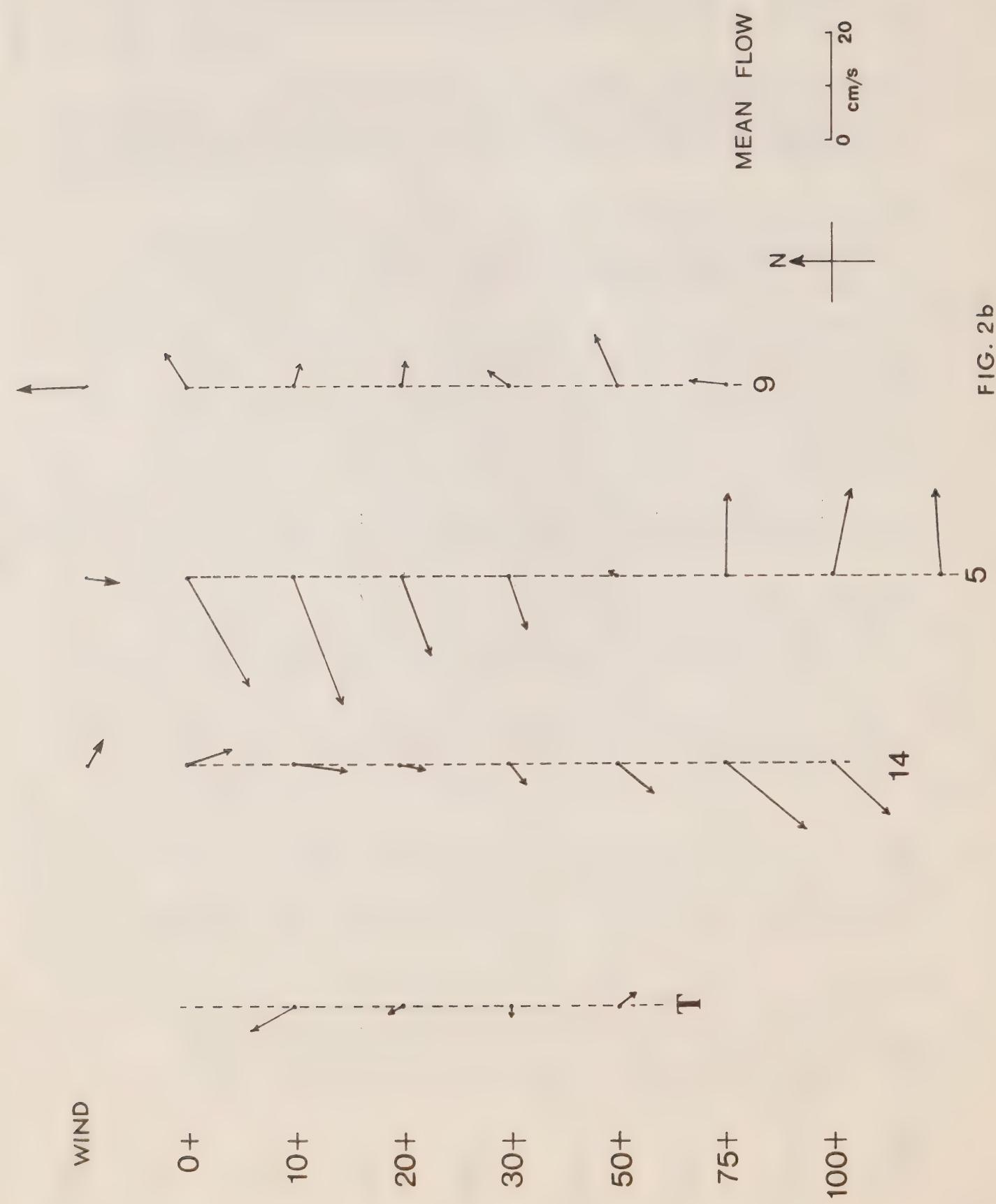
MEAN FLOW



44

43

44



7. Station T results are consistent with those observed in 1977 in Queen Charlotte Strait (Huggett et al, 1980); that is seaward flow at the surface and inward flow at depth.
8. The common occurrence of a change in the mean current velocity between 10-20 m or 20-30 m depth is not inconsistent with an approximate two layer structure to the region during the time of the observations. As indicated in Figures 3a,b, the surface layer, defined as the base of the pycnocline, was typically around 10-20 m deep.

Tidal Currents

Semidiurnal and diurnal tidal current ellipses are plotted in Figures 4 and 5 respectively. (These data are also listed in Appendix B2 and B3.) Percentage variances of currents attributable to tidal currents are listed in Appendix B4. The major features of the tidal motions were as follows.

1. Current motions at tidal frequency were dominated by the semidiurnal component at all stations and depths. At certain locations (eg. stations 44 and 9) the amplitude of these currents exceeded 50 cm/s; typical values were in the range of 25-35 cm/s. Comparison of the magnitudes of the major axes indicates that the semidiurnal components were generally a factor of 2 to 4 greater than the diurnal components. For certain drogue measurements (eg. stations 43 and 44), the computed magnitudes of the diurnal constituents equalled those of the semidiurnal constituents. However comparison with results using Ekman current meter records (Table 3) indicates such estimates are erroneous and linked to incorrectly sampled currents. (These diurnal values are listed in Appendix B3 but not plotted in Figures 5a,b). This effect also leads to an overestimation of the surface semidiurnal tidal component.
2. With few exceptions, the combined diurnal-semidiurnal tidal motions accounted for greater than 60% of the total signal variances at all locations and depths. Comparatively high percentages (>78%) occurred at stations 43, 44, 9 and 5; much lower percentages occurred at deep stations 42 and I-1 to I-3. As exemplified by station 65, the relative amount of variance associated with the tidal motions generally increased with depth.
3. Orientations of semidiurnal and diurnal ellipses at a given station and depth were generally similar, although the weaker diurnal currents displayed considerably more directional variability with depth. Tidal currents were elliptical, and, with few exceptions, quasi-rectilinear.
4. Near-bottom semidiurnal current ellipses in McIntyre Bay (station 65) and at station I-2 tended to align with the bottom contours (cf Figs. 1 and 4a).
5. Semidiurnal currents at stations 43 and 44 were roughly aligned with the axis of Hecate Strait whereas at station 42 the flow appeared to be oriented with the deep channel west of Banks Island (Fig. 1).

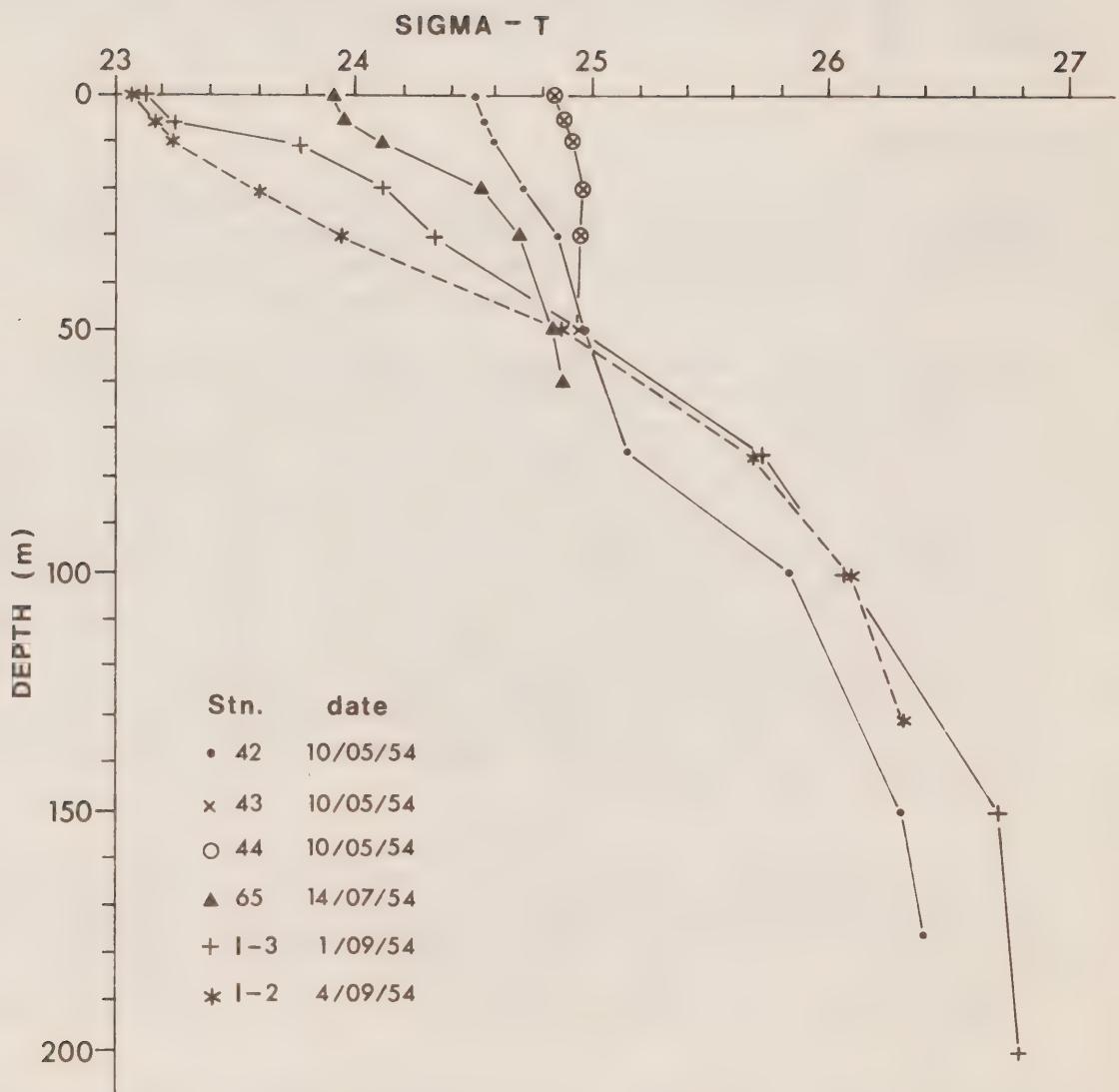


FIG. 3a

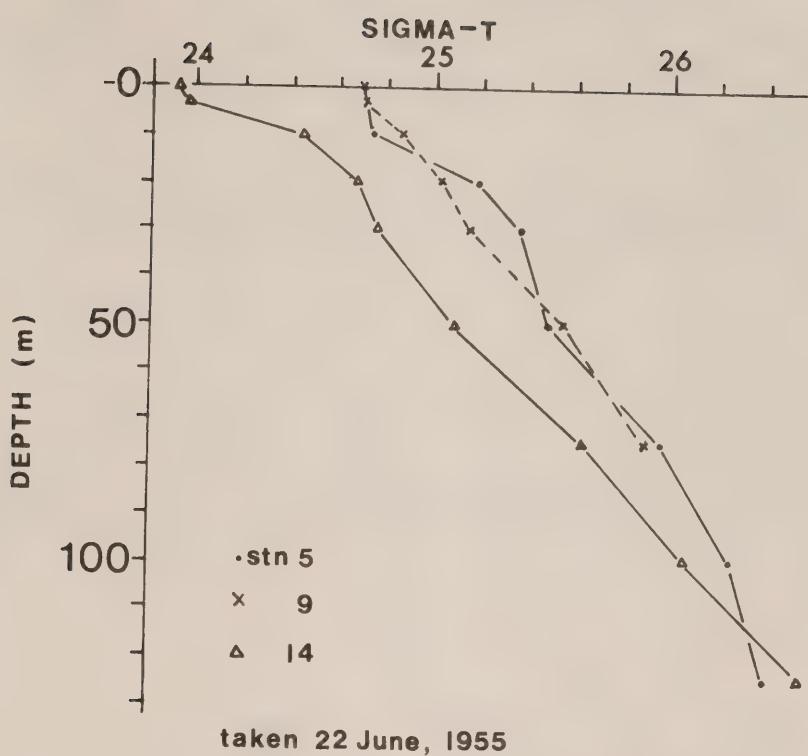


FIG. 3b

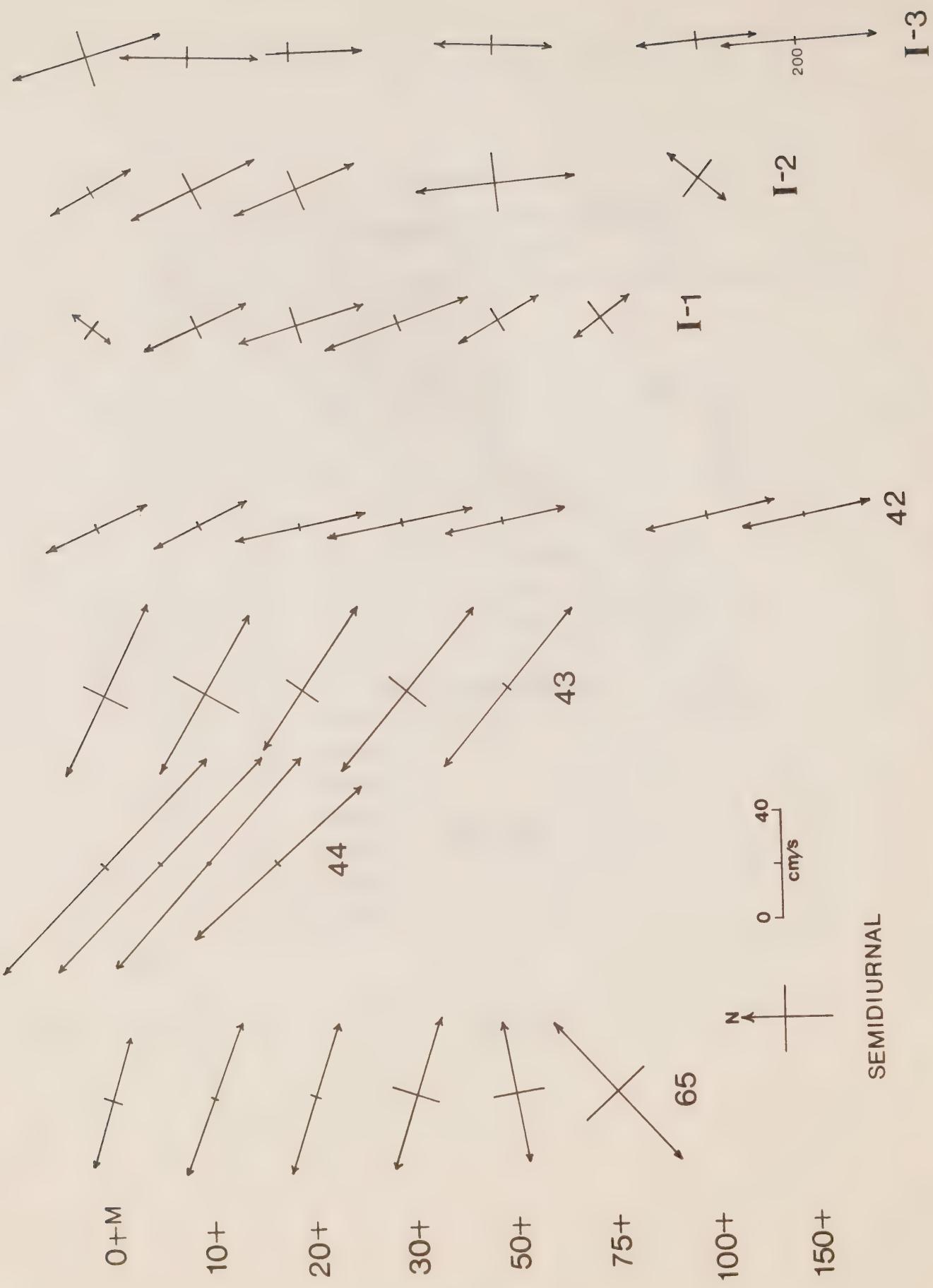
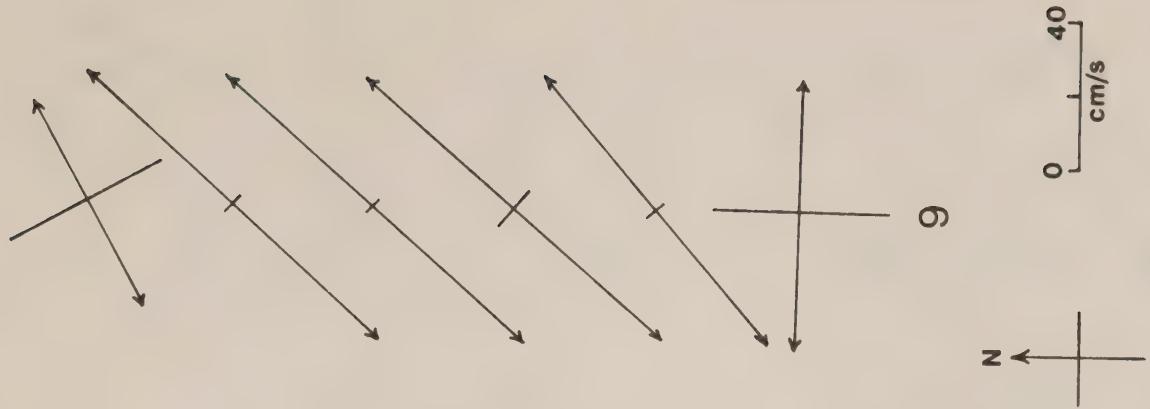


FIG. 4a



SEMIIDIURNAL

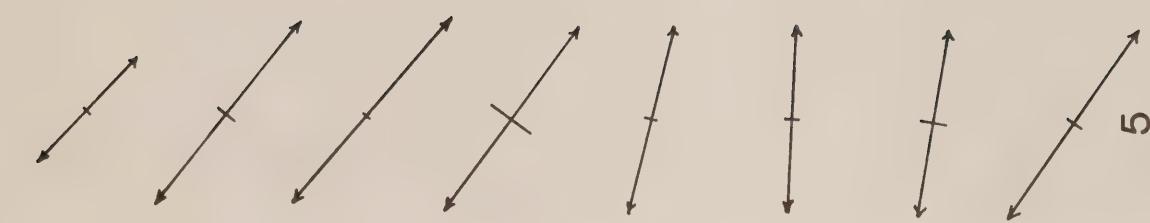
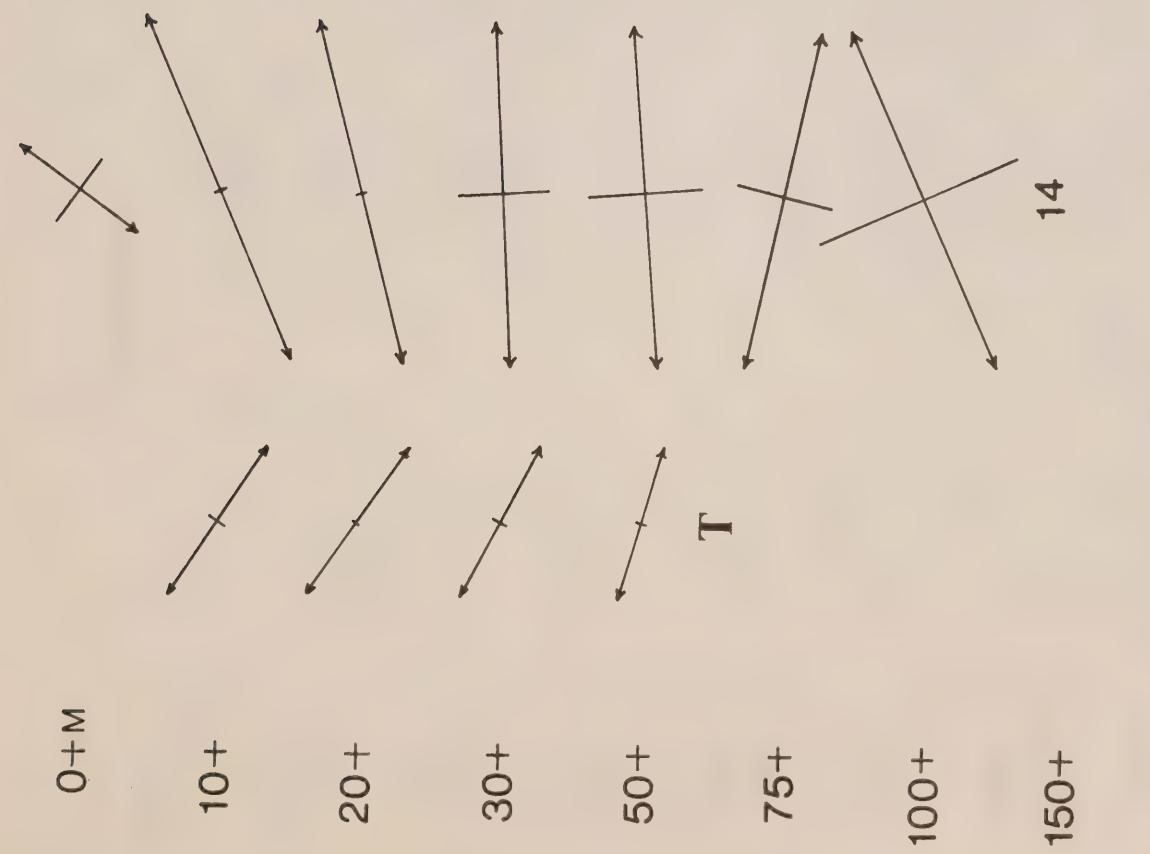


FIG. 4 b



0+M

10+

20+

30+

50+

T

75+

100+

150+

14

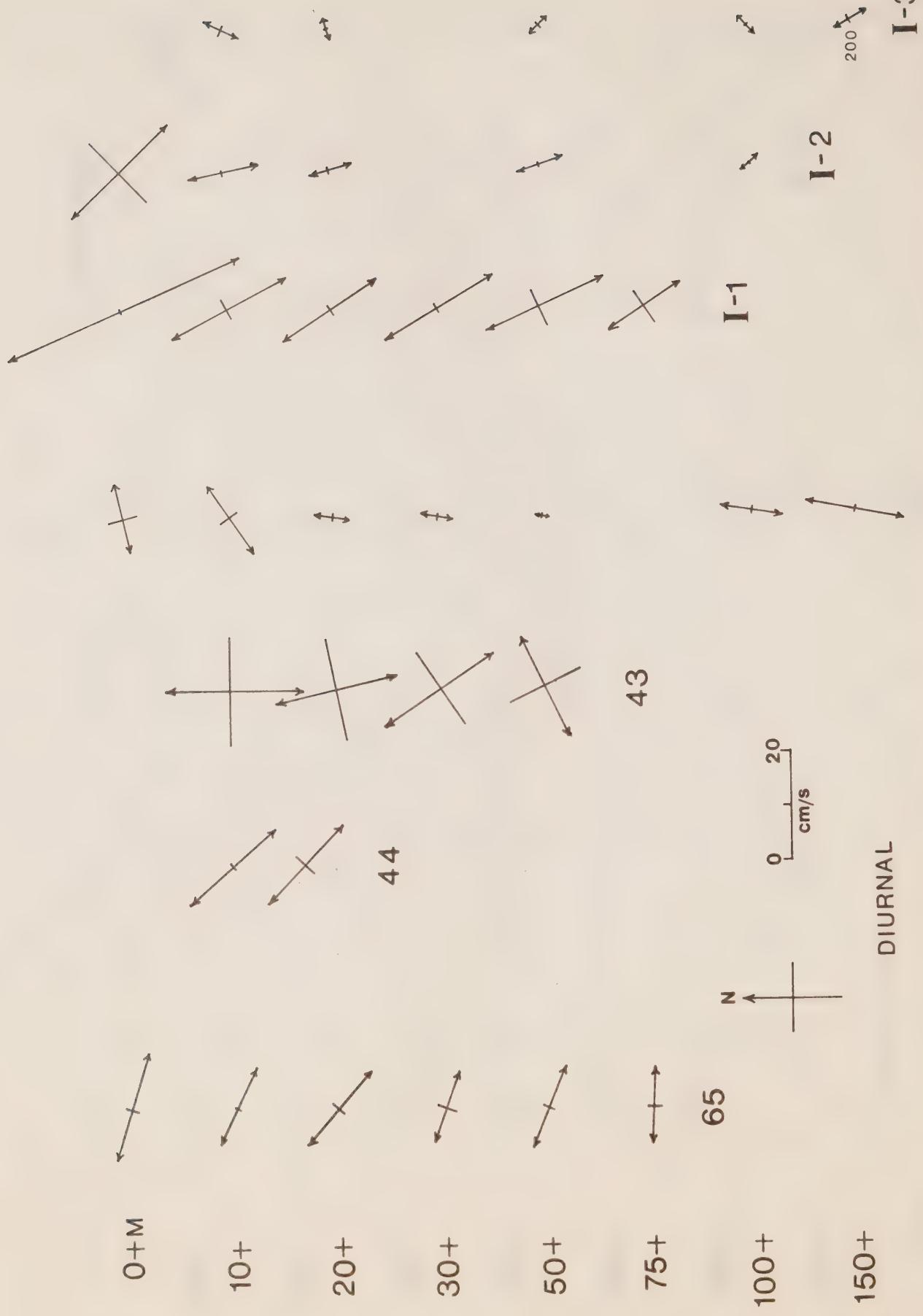


FIG. 5a

42

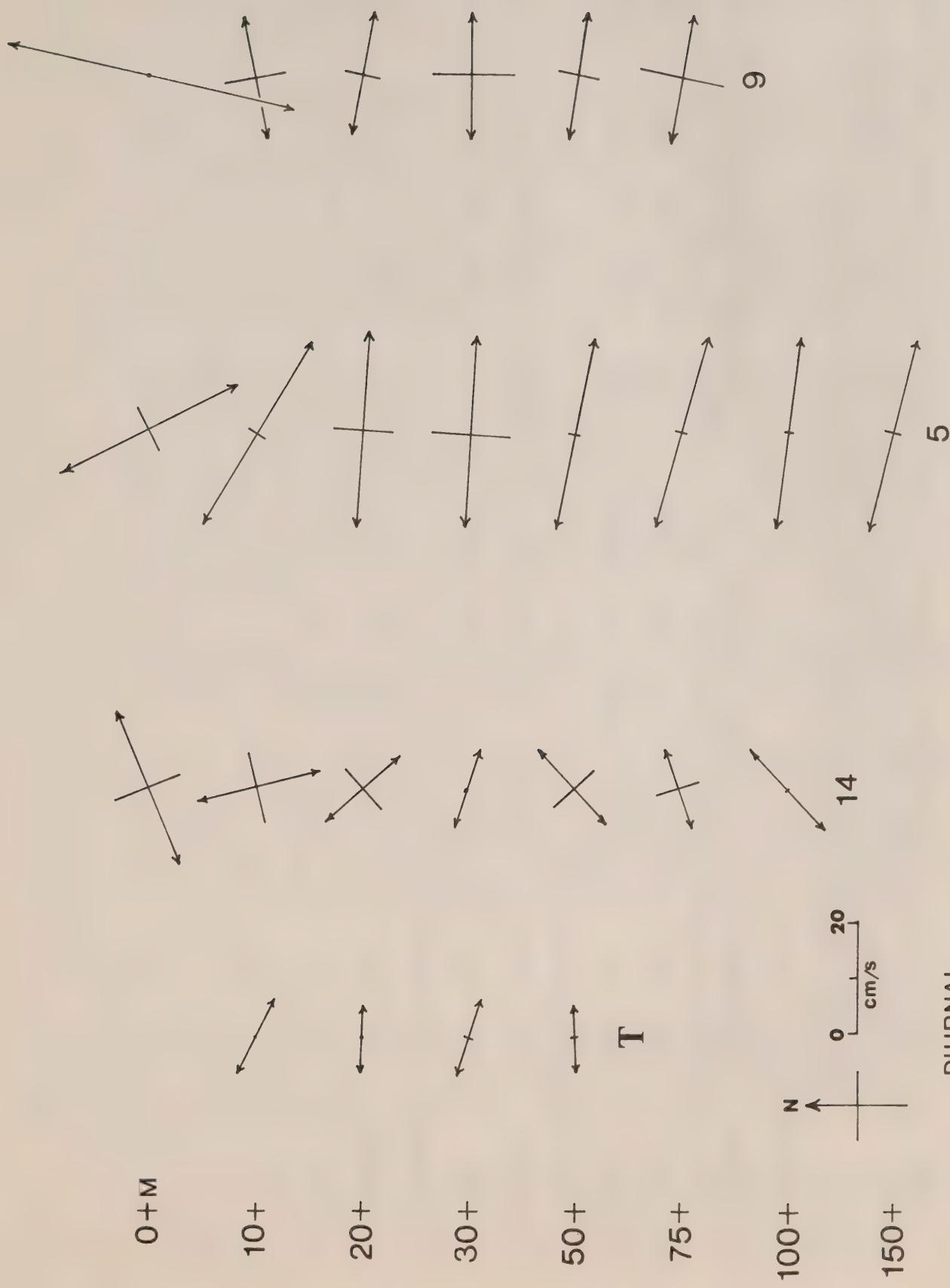


FIG. 5 b

Table 3. Comparison of tidal analysis results derived from drogue measurements and Ekman current meter measurements. For each row the following values appear: mean current speed (cm/s) and direction (degrees counterclockwise from east); diurnal and semidiurnal tidal constituents - major/minor speeds (cm/s), orientation of major axis from east, and relative phase lag to 120° west longitude. Last column gives percent variance due to tidal currents.

STATION 43: 10 m depth

METHOD	MEAN CURRENT cm/s	°	DIURNAL COMPONENT			SEMIDIURNAL Major, Minor, Orient,	COMPONENT Major, Minor, Orient, g°	% VARIANCE			
			Major,	Minor,	Orient,						
Drogue	3.1	99	38.2	-4.9	-29°	194	37.3	-12.5	-31	186	85
Ekman	4.8	48	12.9	-9.6	89	219	35.4	-14.9	-30	187	88
STATION 43: 20 m depth											
Drogue	0.5	236	39.8	-4.6	-33	194	38.9	-11.6	-35	186	79
Ekman	4.1	232	11.8	-9.5	-79	205	37.4	-8.9	-34	182	84
STATION 44: 10 m depth											
Drogue	1.6	186	45.2	3.3	-42	185	53.0	-0.6	-42	139	88
Ekman	1.7	27	11.8	-1.3	-47	148	46.7	0.2	-50	138	91

5. (continued). Similarly, the semidiurnal ellipses at I-1 and I-2 were aligned with the axis of the strait while at I-3 the orientation was approximately parallel to the deep channel.
6. Semidiurnal currents at stations 5, 9, and 14 appeared to be influenced by the re-entrant channels leading landward from the offshore slope region. Near-bottom currents at 9 and 14 were also aligned differently and much more rotary than at other depths, possibly due to presence of local curvature in bottom topography.
7. Diurnal currents were insignificant at deep stations 42 and I-3 at the time of the observations, but as with the semidiurnal constituents were amplified at shallow locations (stations 44 and I-1). Unlike the semidiurnal component there were no obvious effects of bathymetry on near-bottom diurnal motions.
8. The phase lags of the diurnal and semidiurnal constituents differed markedly with one another at a given location and depth and with the local tide height (Table 4). However, for a given constituent and station, phases had considerable consistency with depth (Table 5). Some of the variability in phase is attributable to inaccuracies associated with the analysis of short time series. Nevertheless the semidiurnal currents consistently led the semidiurnal tides in the region, with a range of around 50-200°, which would indicate that maximum flood (ebb) typically precedes local high (low) water by 1½ to 6 hours.

Diurnal currents in most instances led local tidal elevations. The exceptions were at subsurface depths at stations 42 (current lag $\sim 130^\circ$), station 9 (current lag $\sim 90^\circ$), station 5 (lag $\sim 0^\circ$) and station T (lag $\sim 10^\circ$).

9. The most marked changes vertically in phase of the semidiurnal current occurred at stations 42, I-1 and I-2. The phase difference of 180° between the upper and lower layers at station 42 was especially pronounced and may have been caused by strong internal motions generated at the northern head of the Hecate Strait re-entrant trough. Such motions did not appear to be present at station 14 in the southern re-entrant trough north of Vancouver Island.

Sources of Error

The surface drogue measurements would have been affected by wind drag and wave motion as well as errors due to the elementary tracing method. Moreover, as the comparison in Table 3 demonstrates, the drogue tracks were not of sufficient accuracy to allow analytical separation of the diurnal and semidiurnal current components. The Ekman current meters proved more useful than the drogues in this respect.

There are a number of sources of error associated with the Ekman current meter measurements. To begin with, current directions are indicated by small metal balls which are directed by a magnetic compass into one or more of 36 individual compartments in a radially divided compass box. Directions are

Table 4.
 Amplitudes and phases (γ) of major diurnal and semidiurnal tide
 height constituents for Queen Charlotte Sound - Hecate Strait -
 Dixon Entrance Region. (From Harmonic constants and associated data
 for Canadian tidal waters, Vol. 6., 1972).
 Values are height in metres (m) and phase γ ($^{\circ}$).

STATION	LAT.	LONG.	TIDAL			CONSTITUENT: AMPLITUDE AND PHASE				
			K_1	M_2	S_2	m,	\circ	m,	\circ	
Milne Is.	52° 37'	128° 46'	0.95,	127	1.57,	135	4.46,	20	1.37,	45
McKenney Is.	52° 39'	129° 29'	0.90,	126	1.46,	134	4.52,	23	1.35,	46
Griffith Harbour	53° 36'	130° 33'	0.97,	129	1.71,	139	5.96,	30	1.92,	52
Wiah Pt.	54° 07'	132° 19'	0.94,	131	1.51,	138	4.85,	29	1.43,	58

Table 5. Relative phases (ϕ) between coastal high/low water and maximum flood/ebb. First row gives phase (g) of diurnal current minus phase (g) of diurnal tide; Second row gives phase (g) of semidiurnal current minus phase (g) of semidiurnal tide. Tide phases are average values for entire region based values listed in Table 3. $1/2(O_1 + K_1)$ tide = 133° ; M_2 tide = 26° . All values in degrees.

DEPTH (m)	44	43	42	65	I-3	I-2	I-1	9	14	5	T
0	50 -6	60 157	131 46	239 107	215 109	31 189	137 246	35 -1	223 67	90 59	7 98
10	195 112	86 160	-	24 107	102 126	99 206	81 39	-92 122	73 55	3 76	8 102
20	202 109	72 156	-133 50	18 109	145 111	78 196	88 205	-83 122	107 57	-2 83	5 106
30	-	220 159	-133 222	19 114	-	-	90 49	-86 125	-43 57	-3 92	9 104
50	-	158 150	-132 210	31 104	0 125	110 141	61 39	-92 110	109 58	-1 82	-
75	-	-	-	26 88	-	-	63 34	-80 297	127 60	-1 82	-
100	-	-	-133 214	-	155 92	125 100	-	-	142 40	-3 83	-
Other	-	-	(150m) -133	-	(200m) 170	-	-	-	-	(125m) -134	78
			217		97						

therefore accurate to $\pm 10^\circ$. Current meter rotor counts were generally obtained for periods of 3 minutes only at each depth, or roughly half the recommended integration time (S. Tabata, private communication). These "instantaneous" speeds may therefore have been contaminated by wave-induced motions. Moreover, Tabata and Groll (1956) showed that "rotor pumping" at times of large ship-roll or yaw can lead to erroneously high Ekman current speeds. Current directions at such times appeared reliable but were questionable during periods of weak currents (< 5 cm/s). Fortunately, ship-roll wasn't a major factor in the present set of observations. The single mention in the data record to large roll was for the latter part of station 43 following buildup of sea during prolonged southeast winds. The tendency for a vessel to "surge" on its anchor line (scope ~ 3 to 1) also could have produced erroneous Ekman current velocities, especially during times of weak surface flow. No documentation of this effect was presented in the data reports.

Lastly, we note that the brevity of the records made it impossible to separate the various tidal constituents within the diurnal and semidiurnal bands. The values presented here are therefore rough estimates to the K_1 and M_2 tidal current constituents which will be "contaminated" by other constituents, most notably the O_1 and S_2 tidal components. (A record length of 15 days is required for resolution of these constituents.) This feature alone emphasizes the limited application of Ekman current meter records and makes one aware of the significant contribution to oceanic research by the in situ, self-contained current meter.

4. Acknowledgements

I wish to thank Mr. Al Dodimead for bringing the data to my attention and Dr. Sus Tabata (who helped collect the current meter records in 1955) for advising on the quality of data. Special thanks are due to Mr. Don Stewart who carefully analyzed the raw wind and current records through a contract with Interact Computing Services. Mr. Dave Ramsden is acknowledged for assisting with the computations. Funds for the contract were kindly made available through Dr. Alan Cornford of Ocean Information Section.

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6. List of Figure Captions

Figure 1. Station positions. Depths in metres.

Figure 2. Mean currents (averaged over lengths of record) for a. 1954 and b. 1955 current records. Vectors give velocity at each depth with north upward. Mean wind vector is at top of diagram.

Figure 3. Density profiles at selected stations for times of current meter observations. a. 1954; b. 1955.

Figure 4. Semidiurnal tidal current ellipse axes for each location and depth. Major axis with arrow heads; half length of axis gives current speed for that axis. North is upward in figure. Note that bottom measurements at I-3 were at 200 m depth. a. 1954; b. 1955.

Figure 5. Diurnal tidal current ellipse axes for each location and depth. Note reduction in speed scale compared to Figure 4. a. 1954; b. 1955.

Appendix A. Wind and current plots.

The wind and current data are plotted in three groups as follows.

1. Stick (vector) plots of the unedited winds and currents. North is toward the top of the page and east to the right along the time axis. Each vertical tick along time axis corresponds to 2 hours. Wind speeds in units of 5 m/s, currents in units of 50 cm/s. The dashed horizontal line in each plot separates wind and drogue observations (above) from Ekman current meter measurements (below).
2. Plots of the east-west and north-south components of winds and currents with east and north oriented in positive Cartesian directions. Speed scales and dashed lines as in A1. The time scale has been compressed relative to A1 such that time between ticks is 4 hours.
3. Plots of the east-west and north-south components of winds and residual currents. In this case, the mean and combined diurnal - semidiurnal tidal currents have been extracted from the original data. Speed scales and time as in A2.

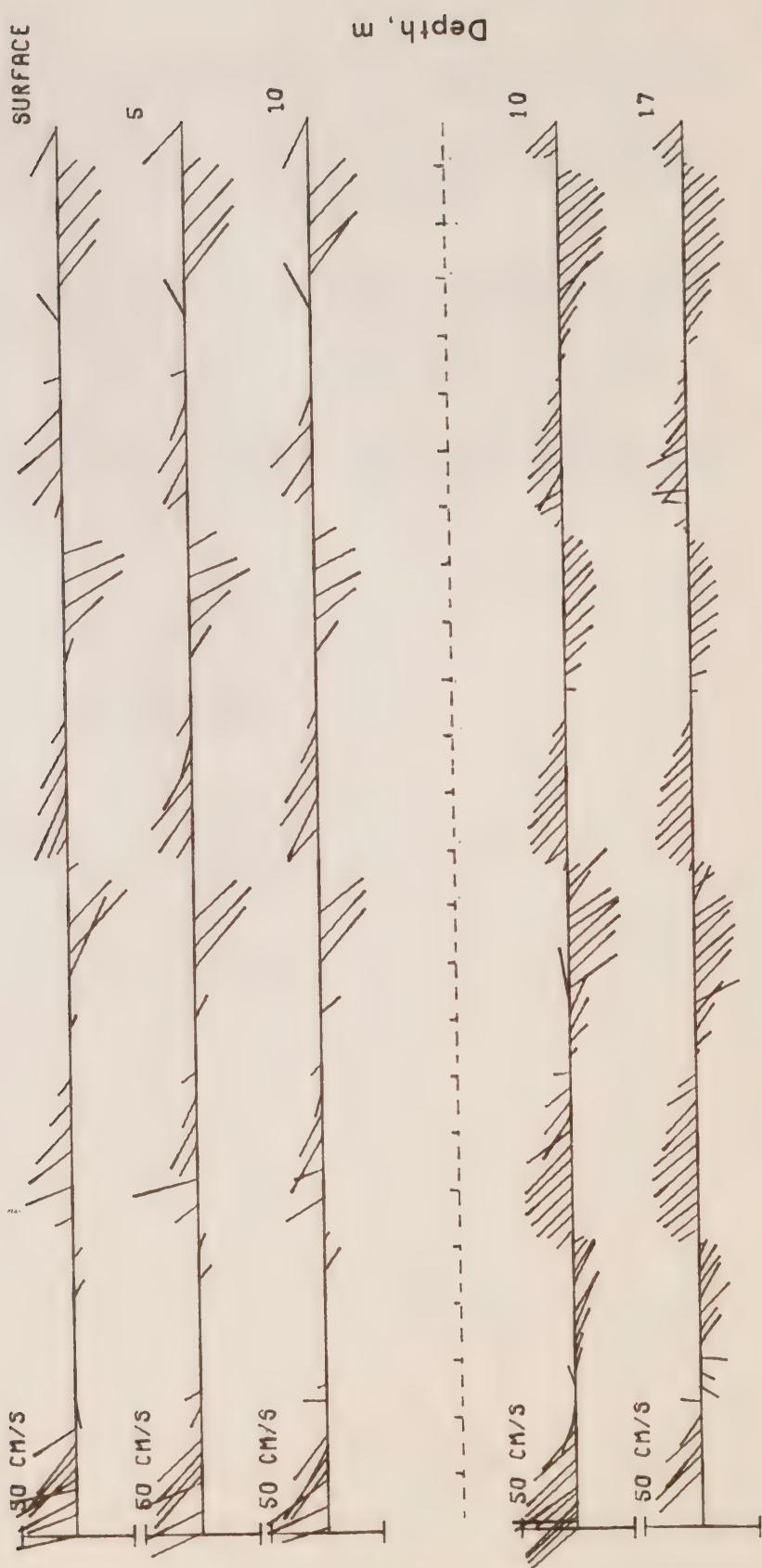
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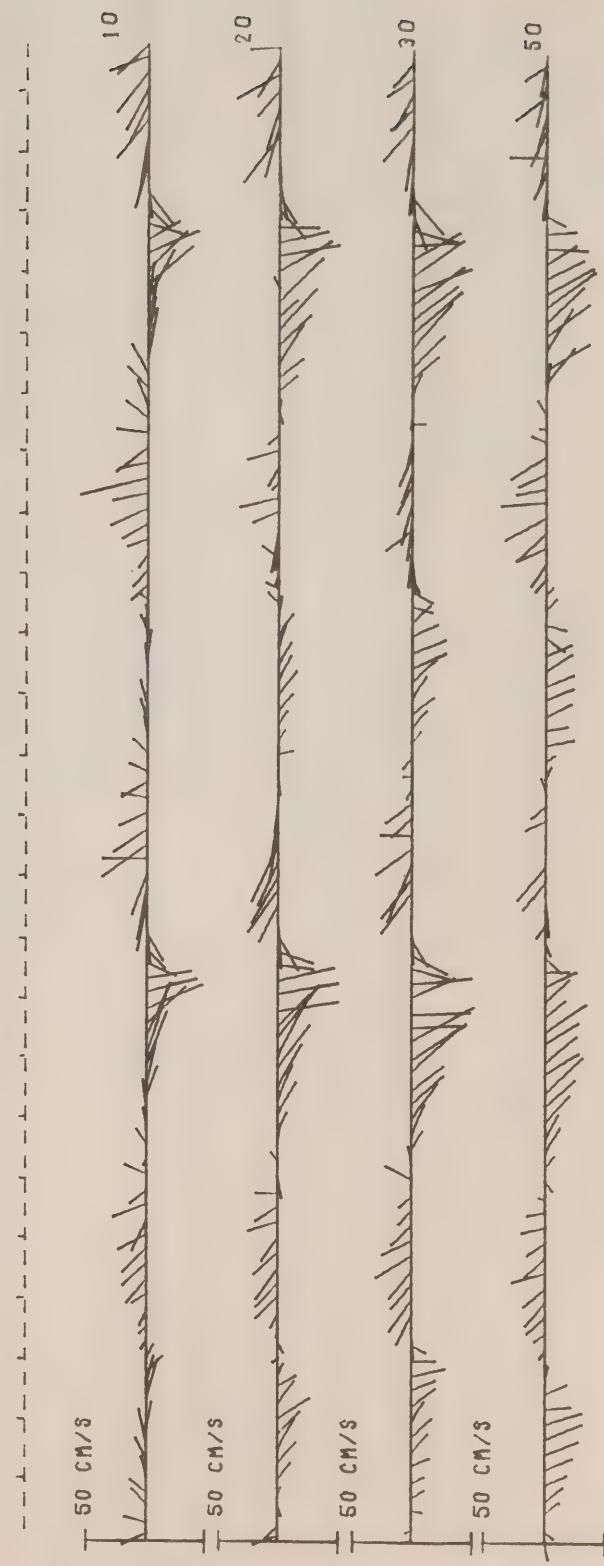
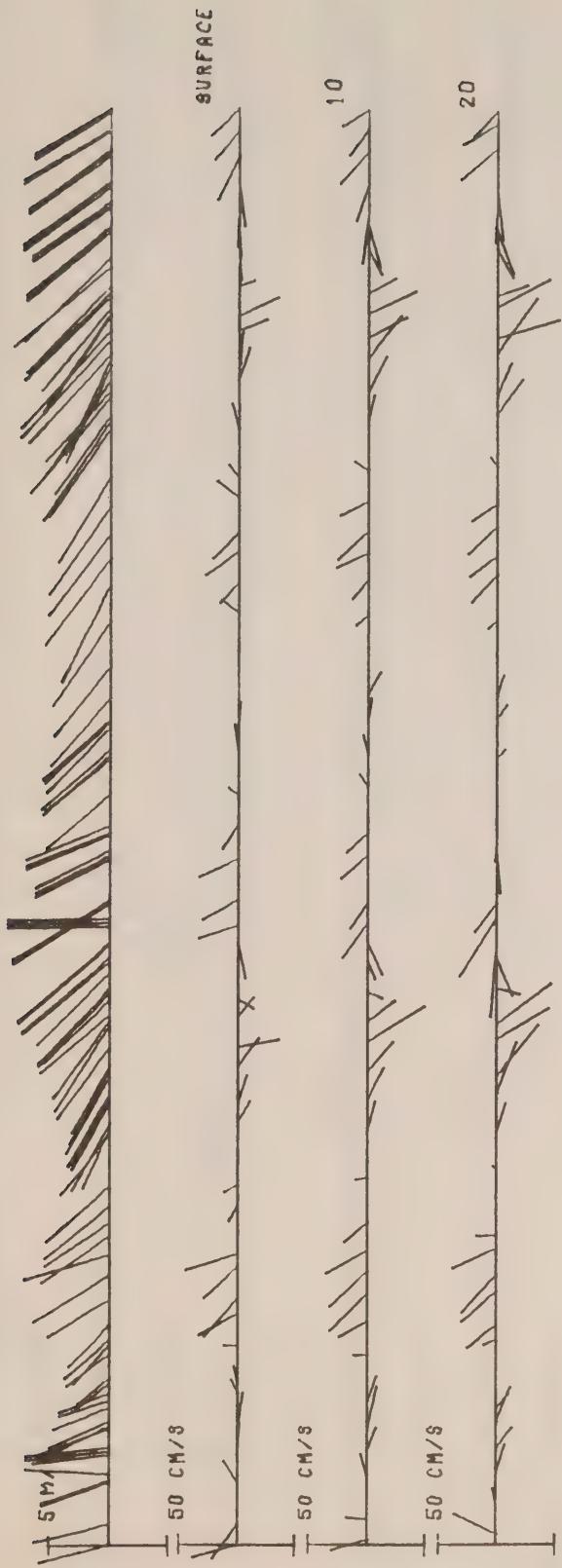
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EKMAN AND DRAG CURRENT METERS

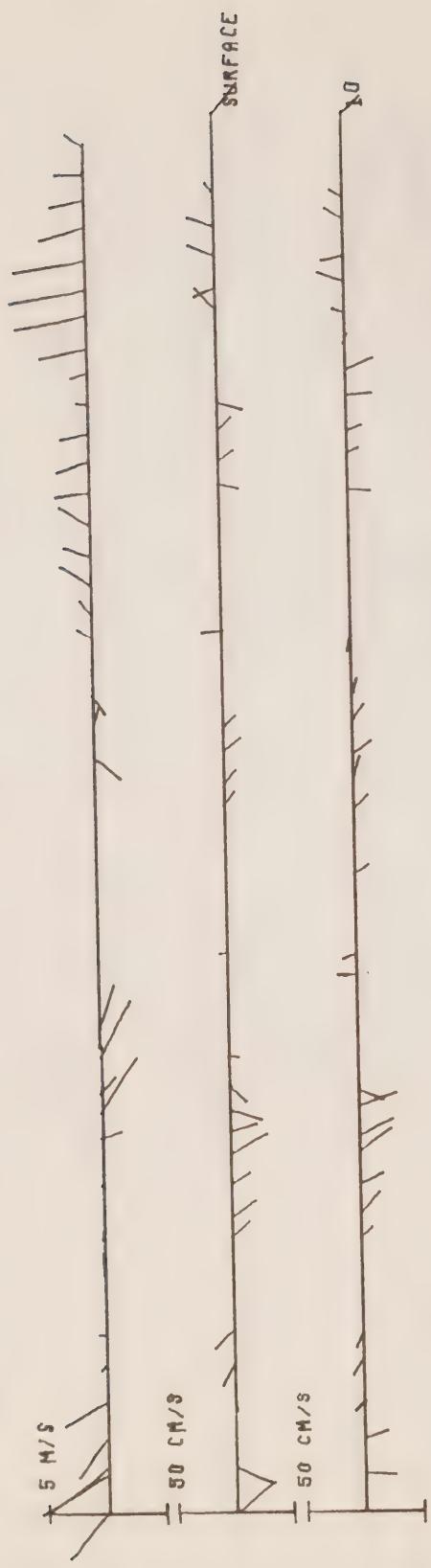
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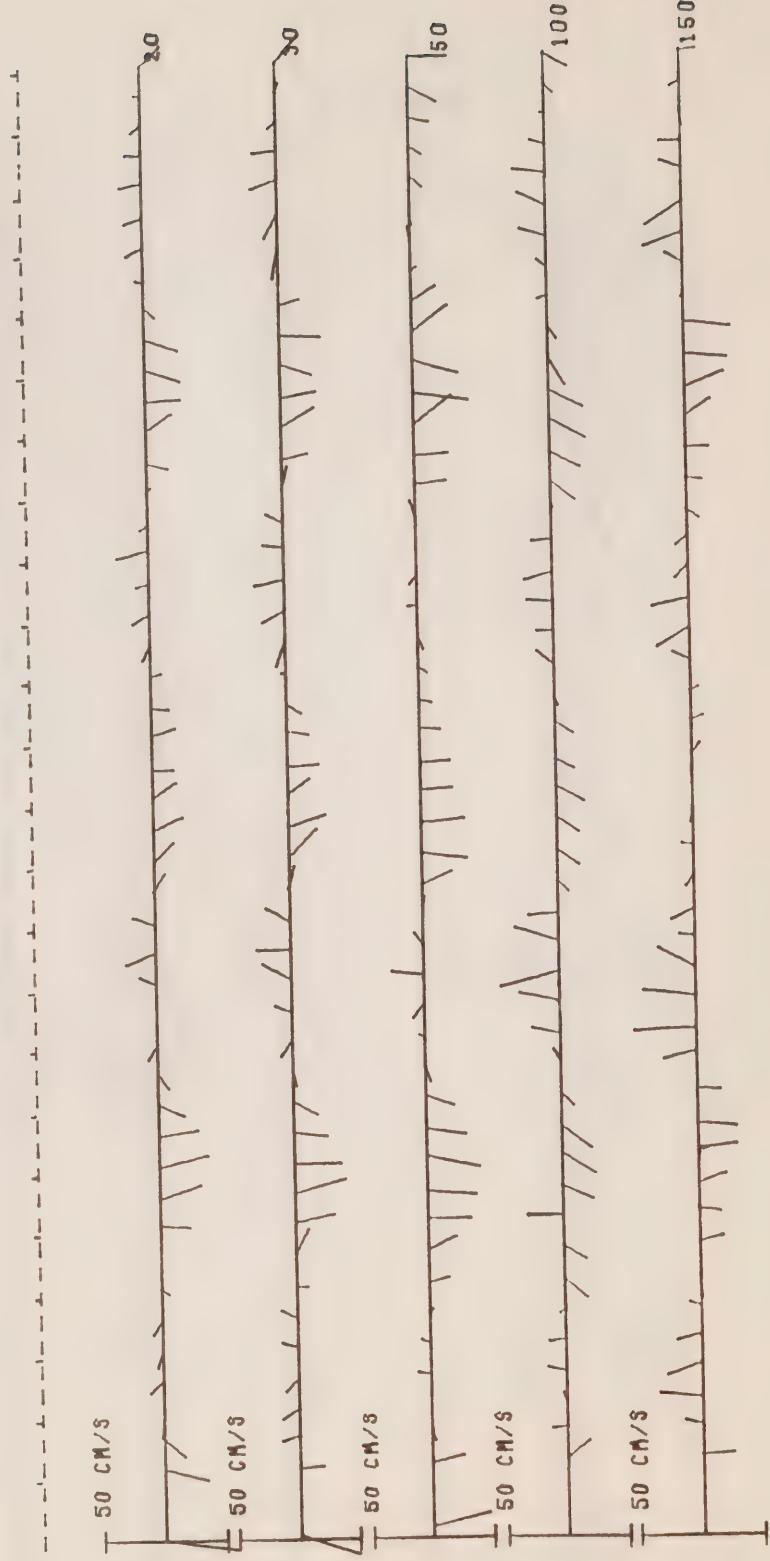




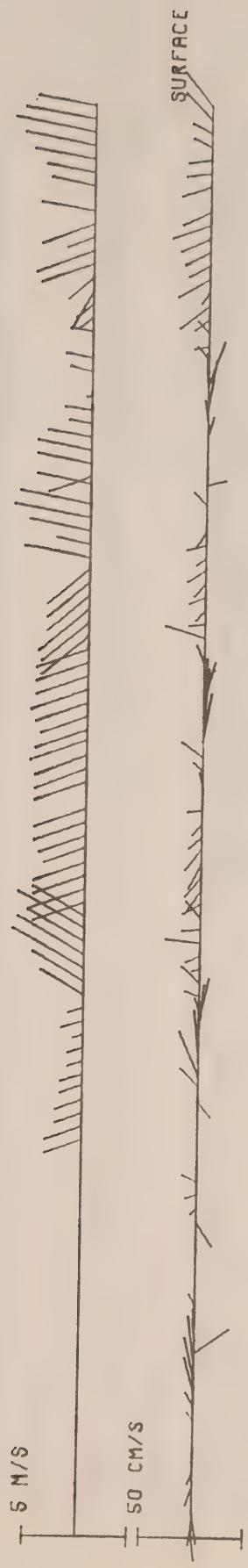
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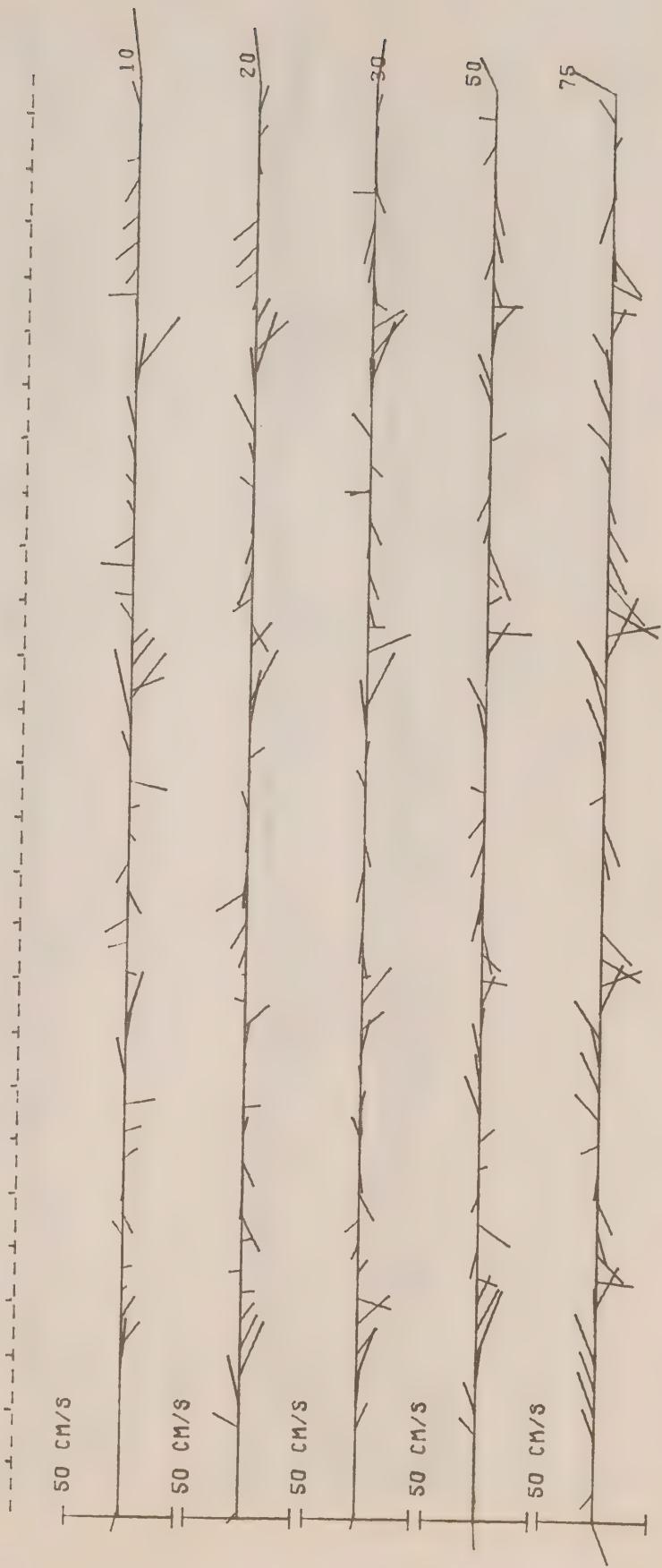
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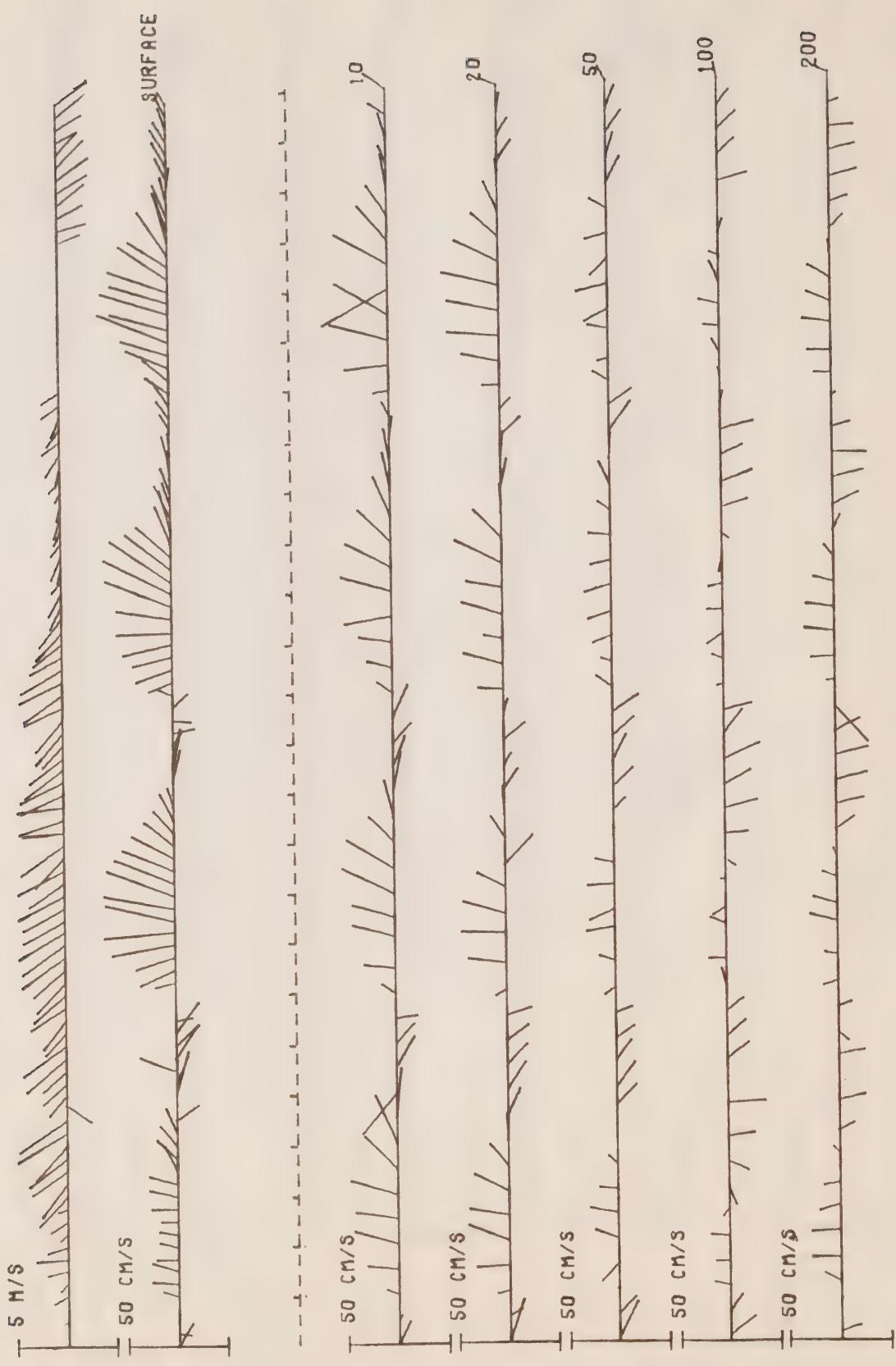


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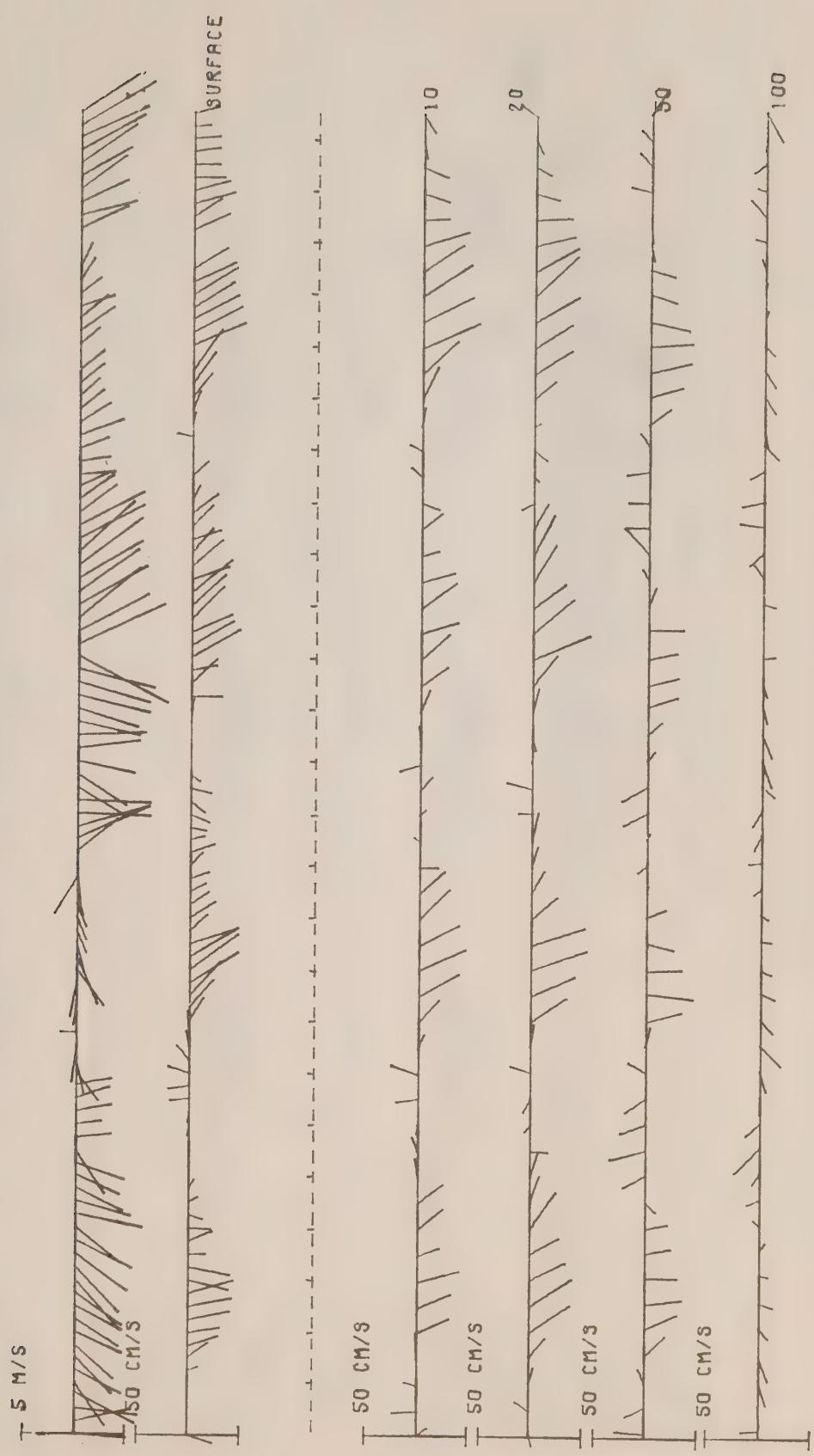


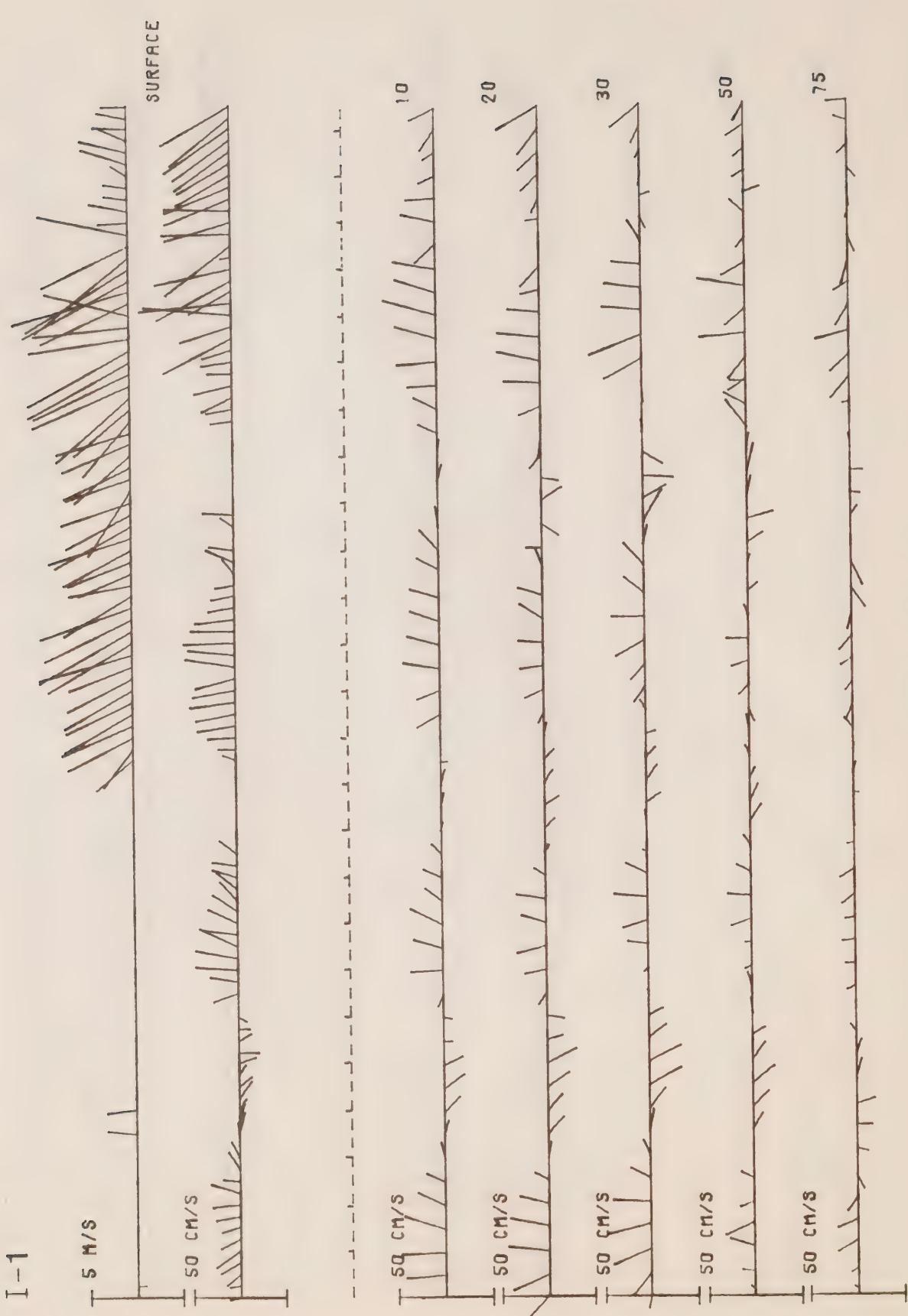
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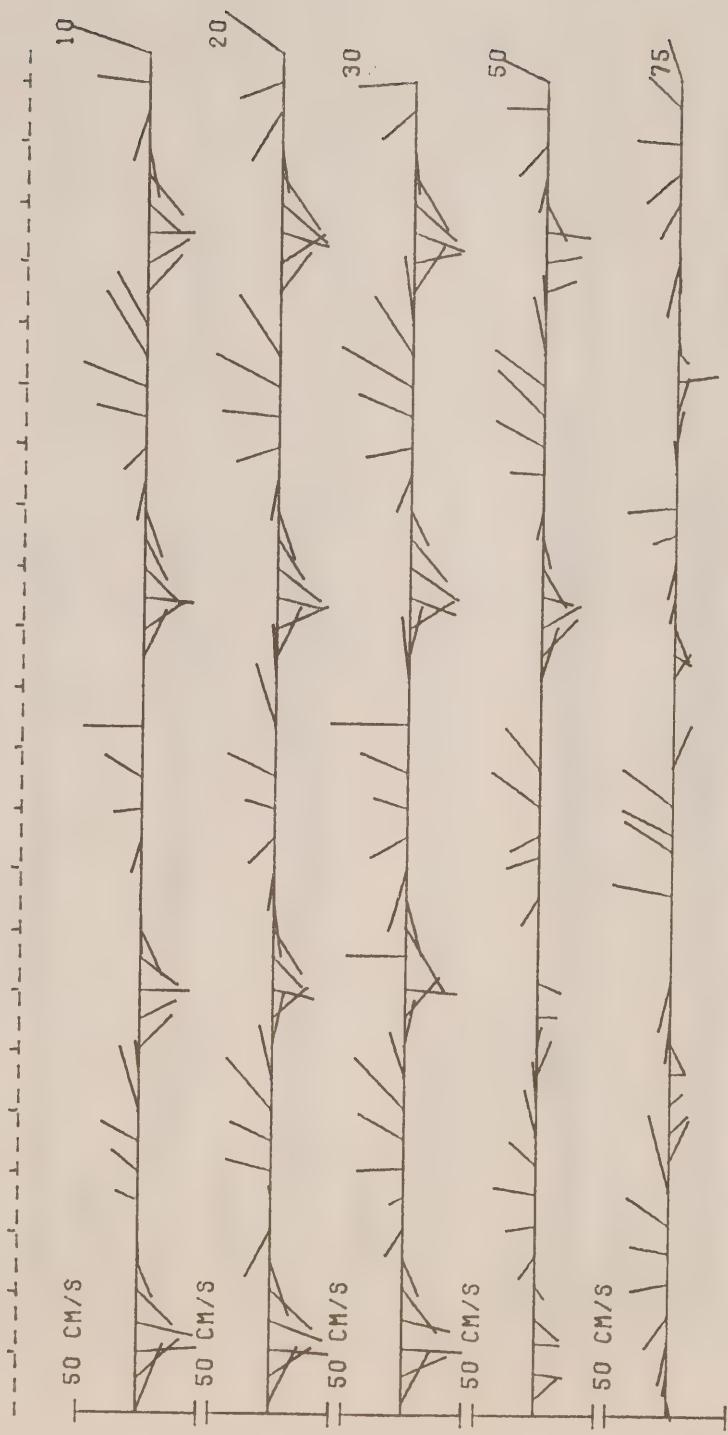
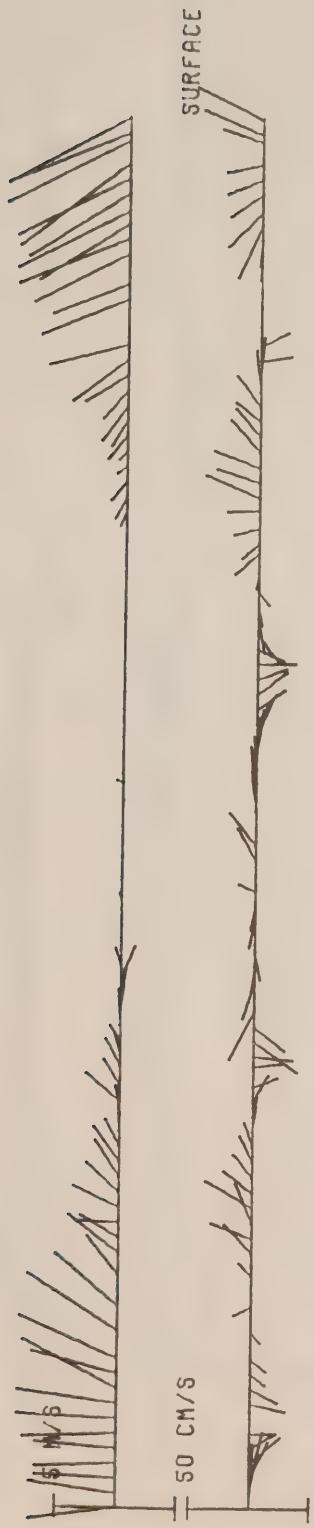


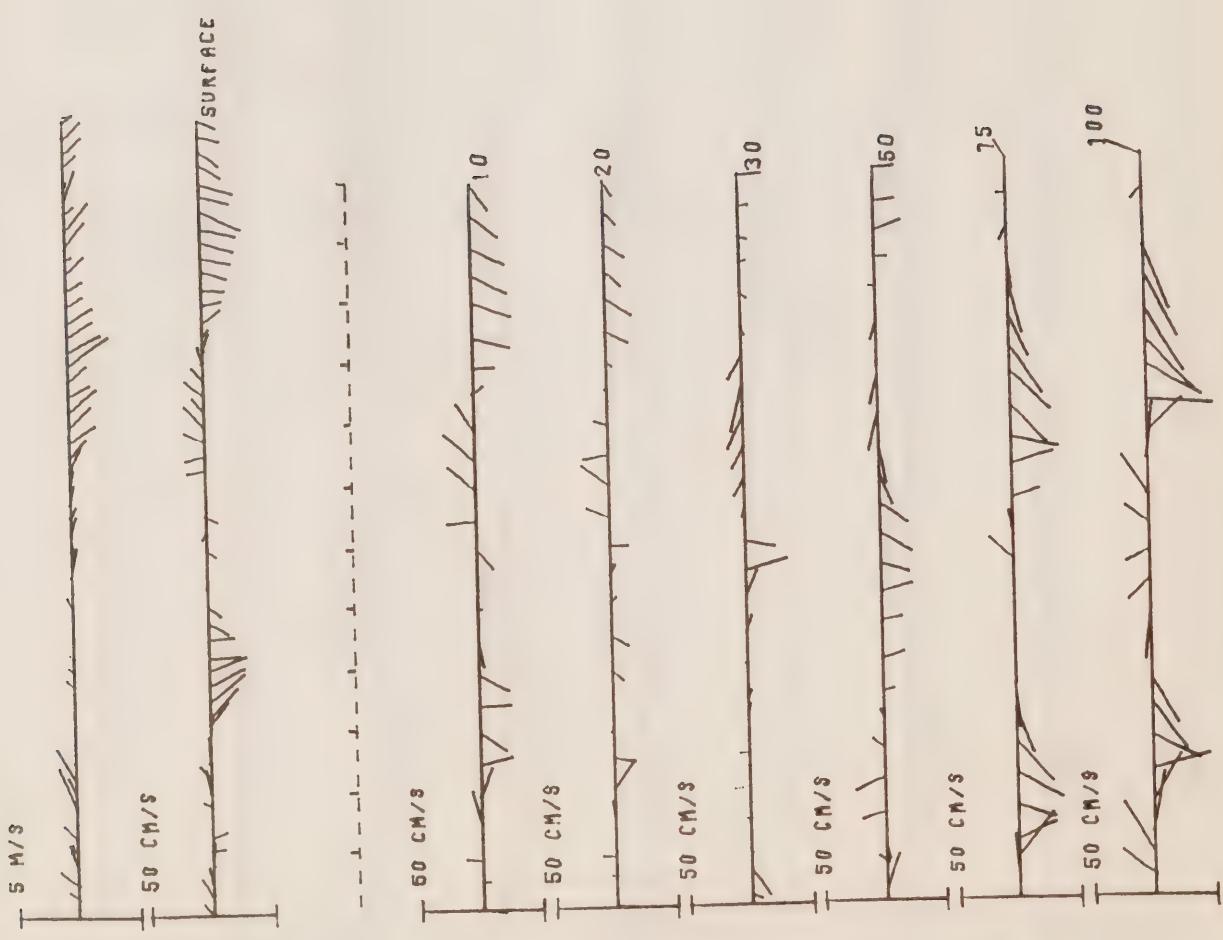
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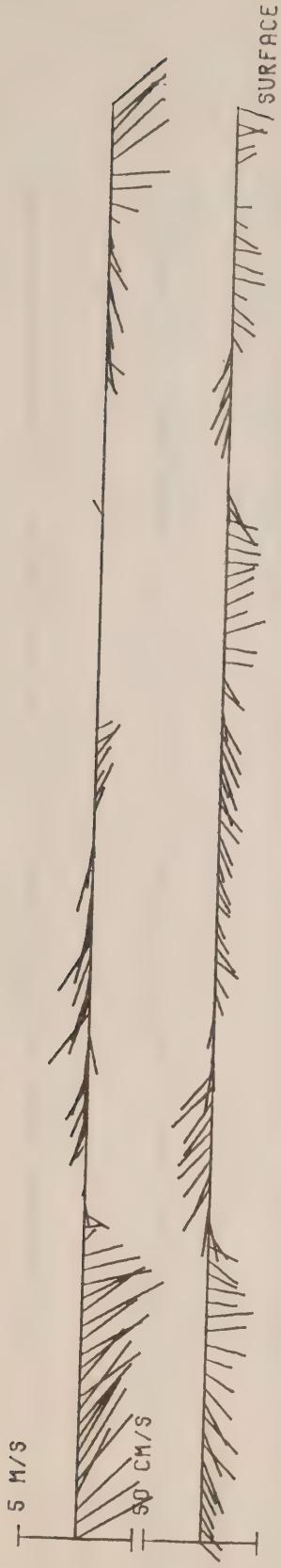


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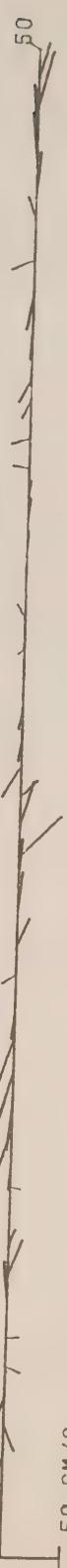
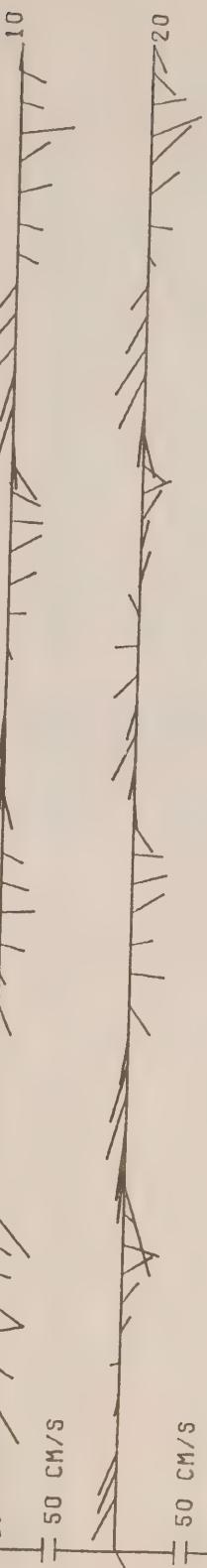
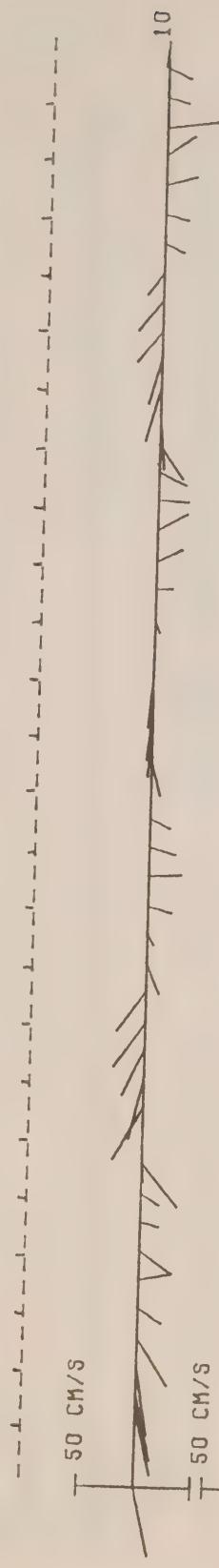




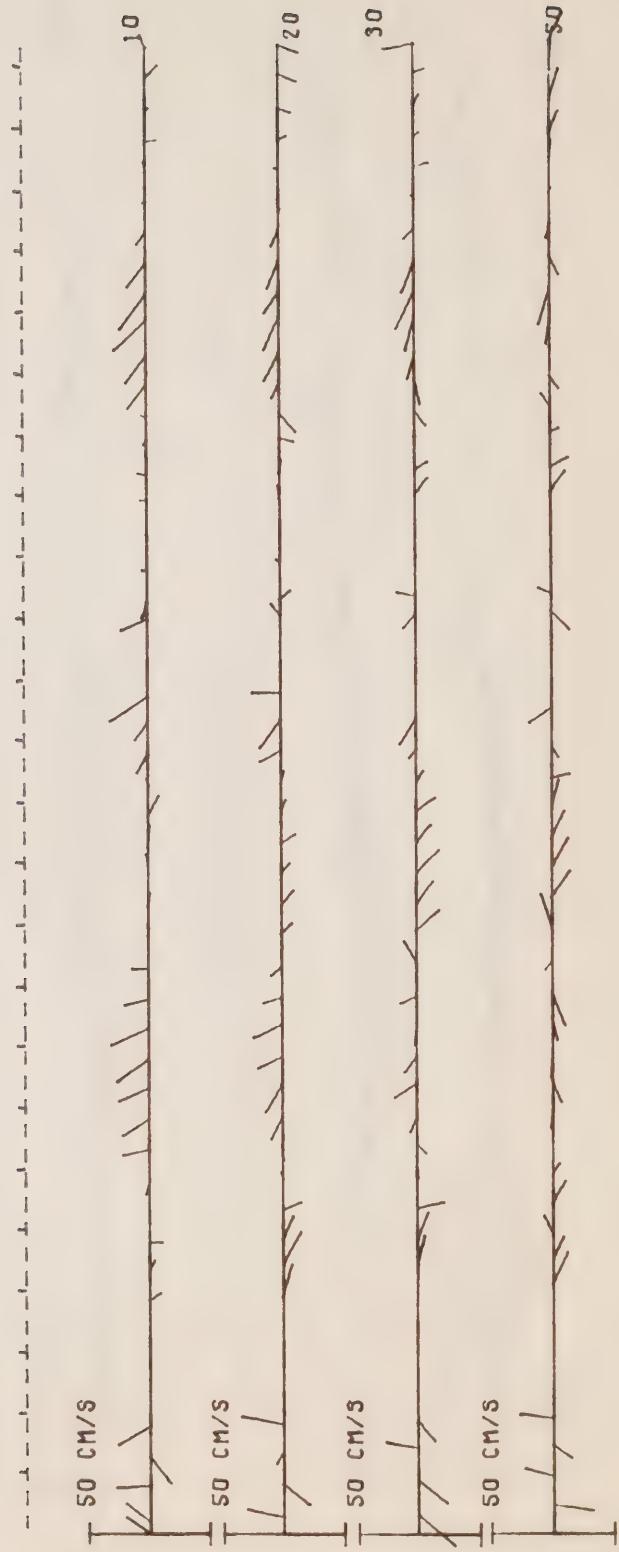
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COMPONENT PLOTS

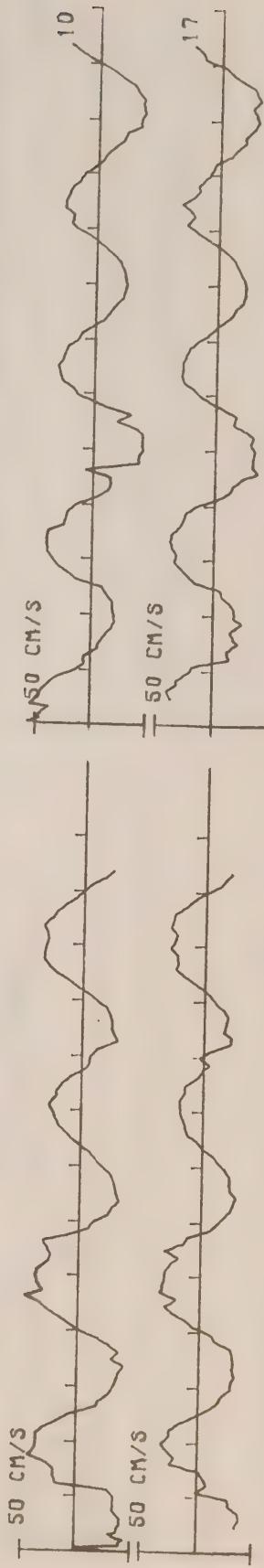
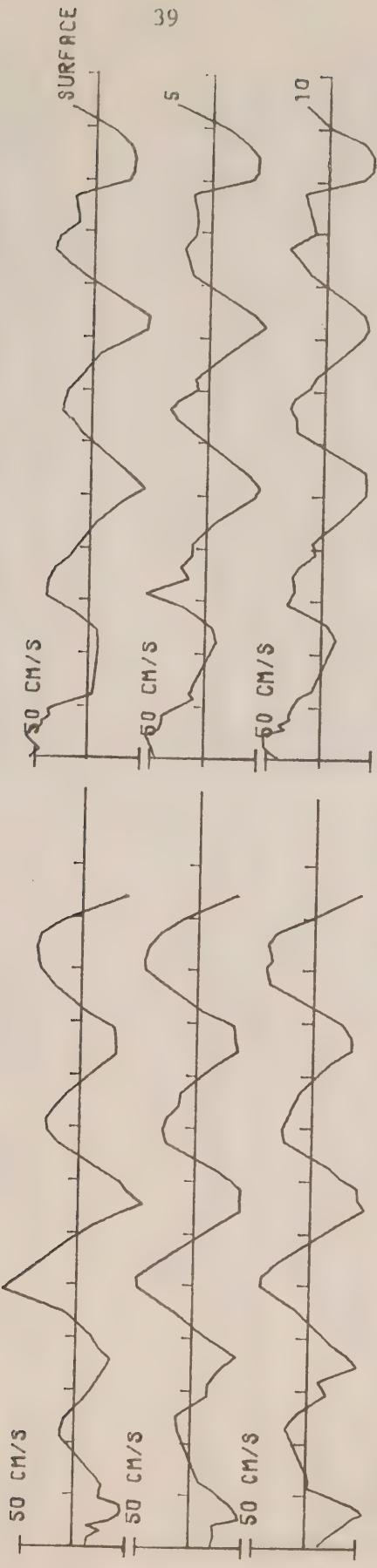
UNEDITED DATA

EKMAN AND DRAG CURRENT METERS

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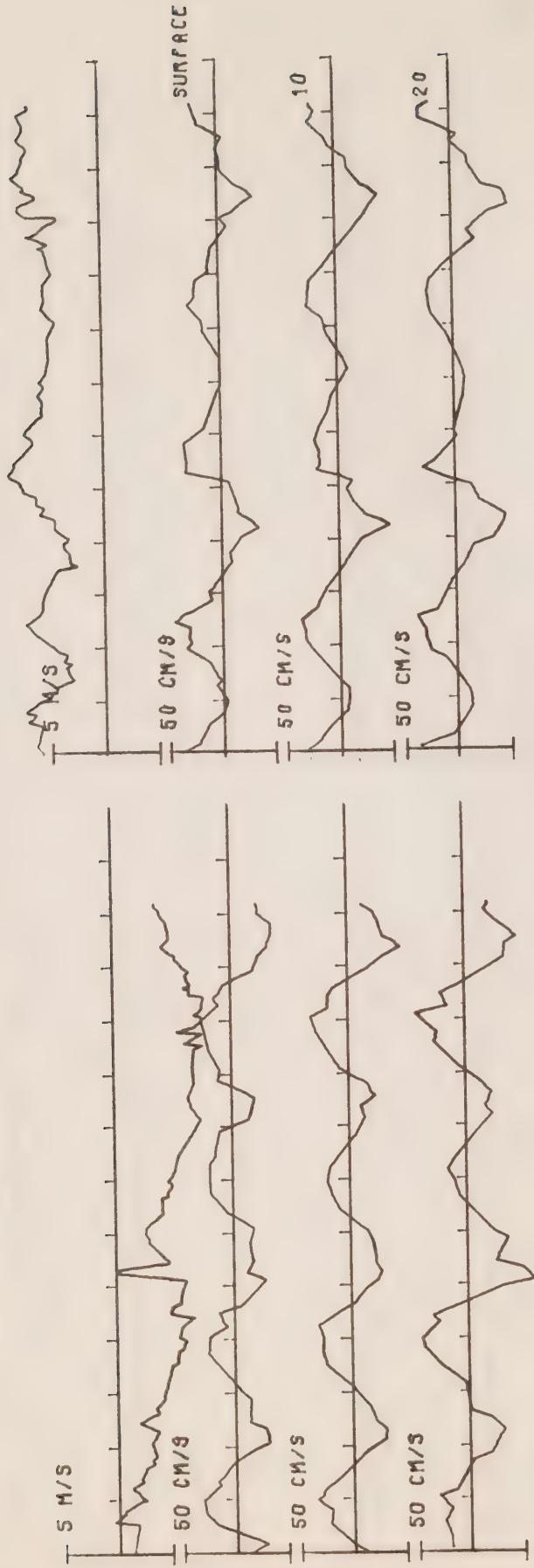
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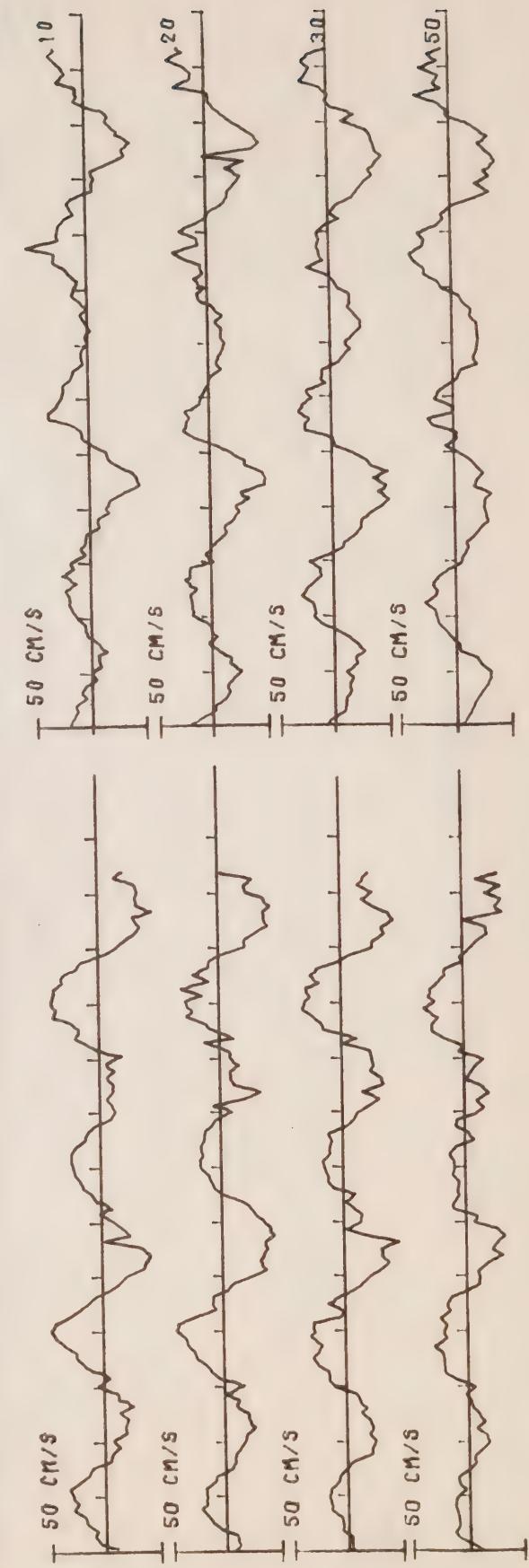
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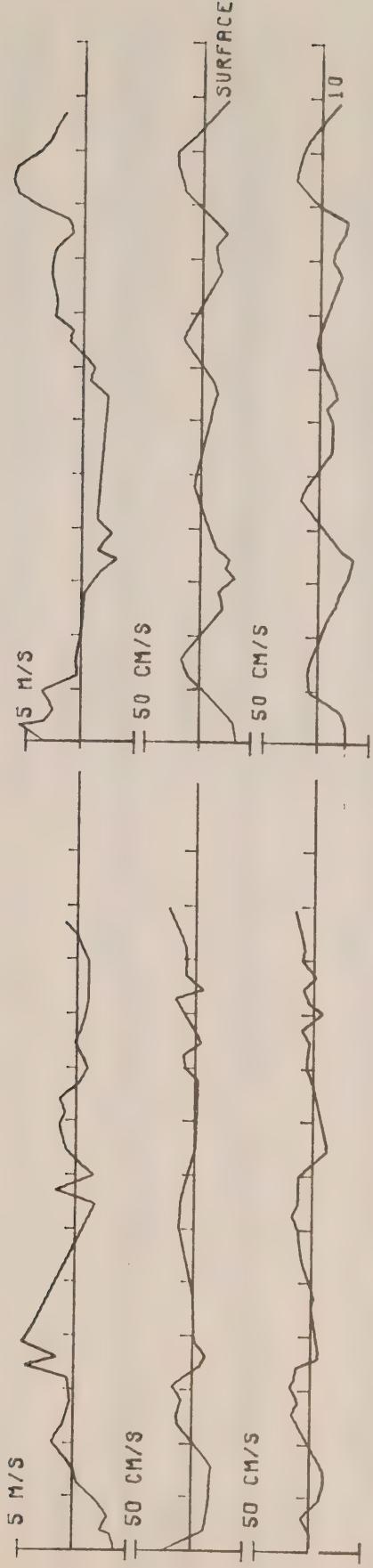
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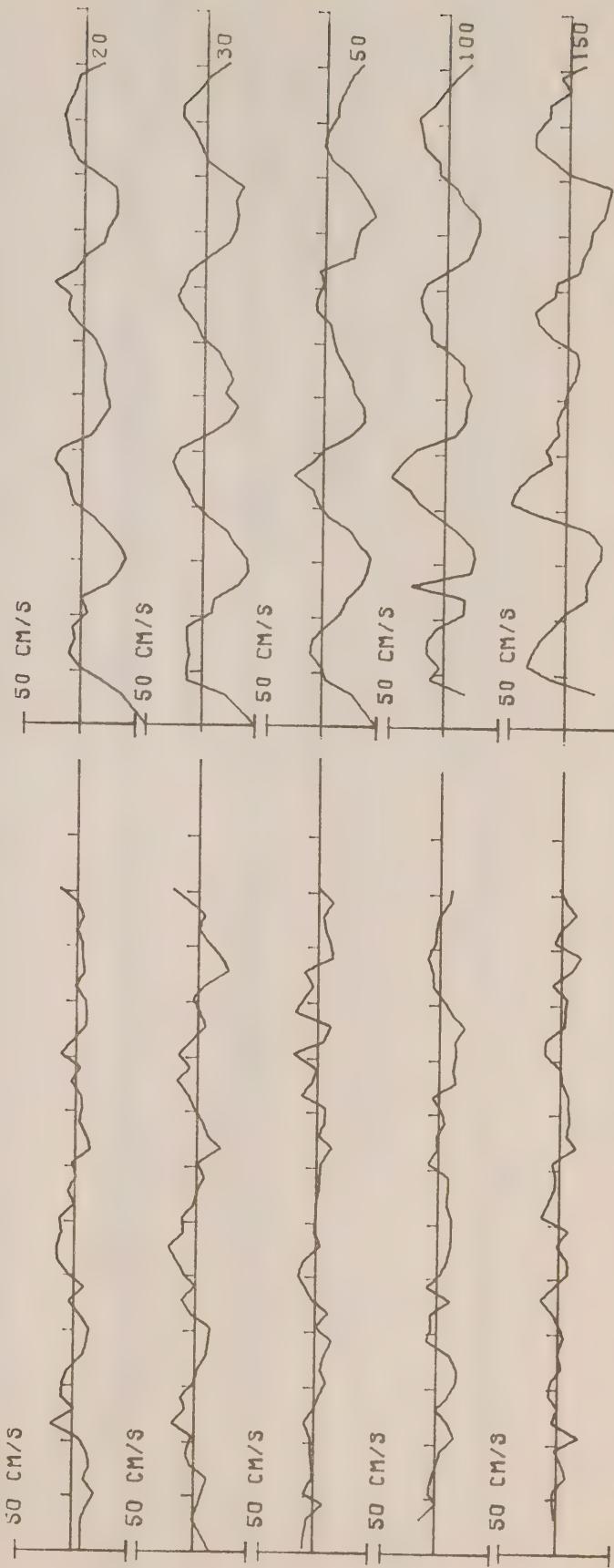
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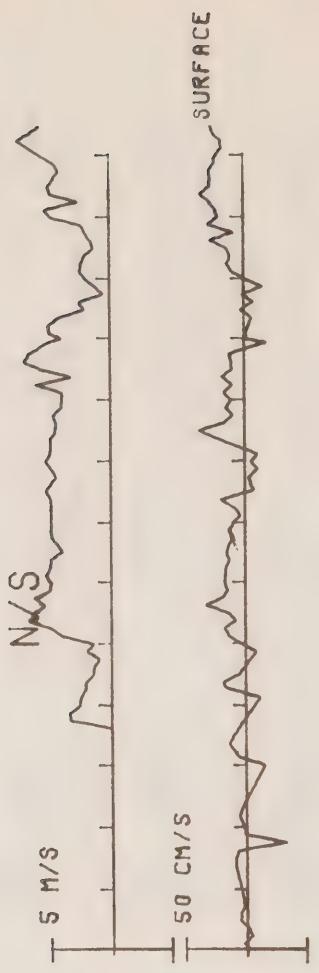
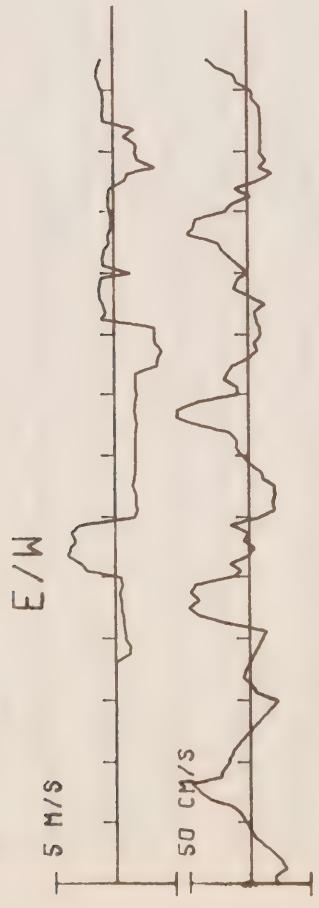
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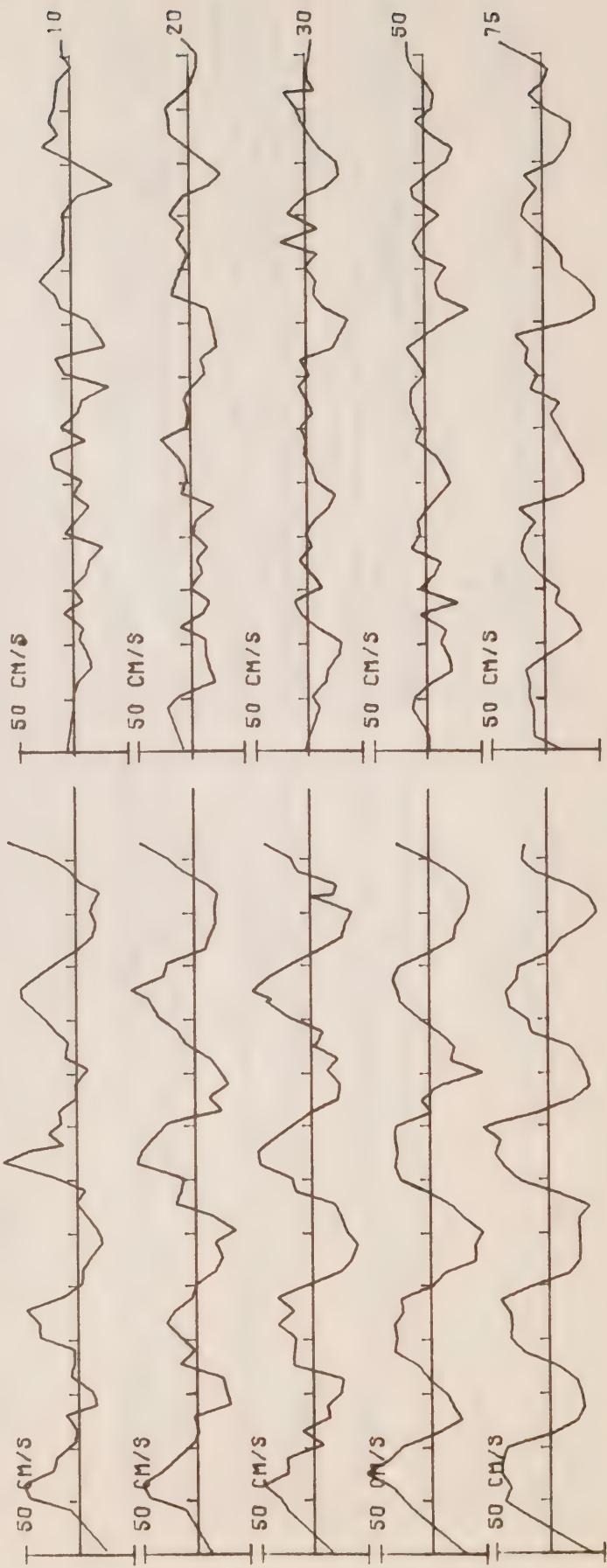
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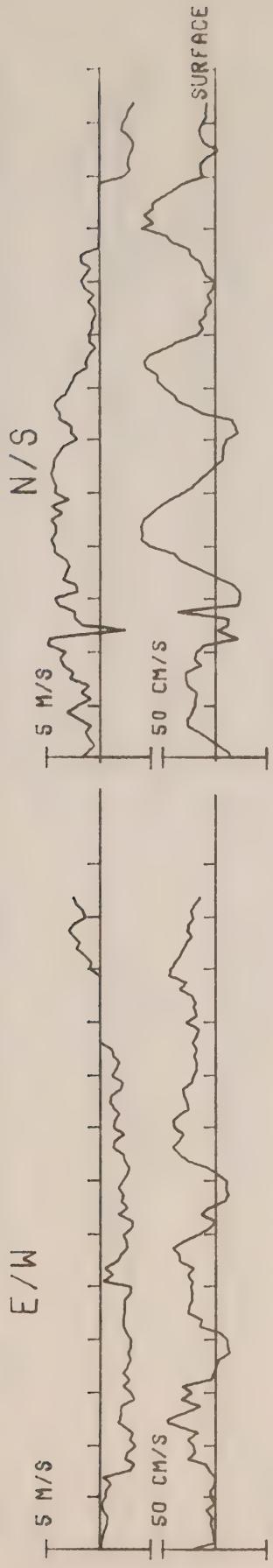
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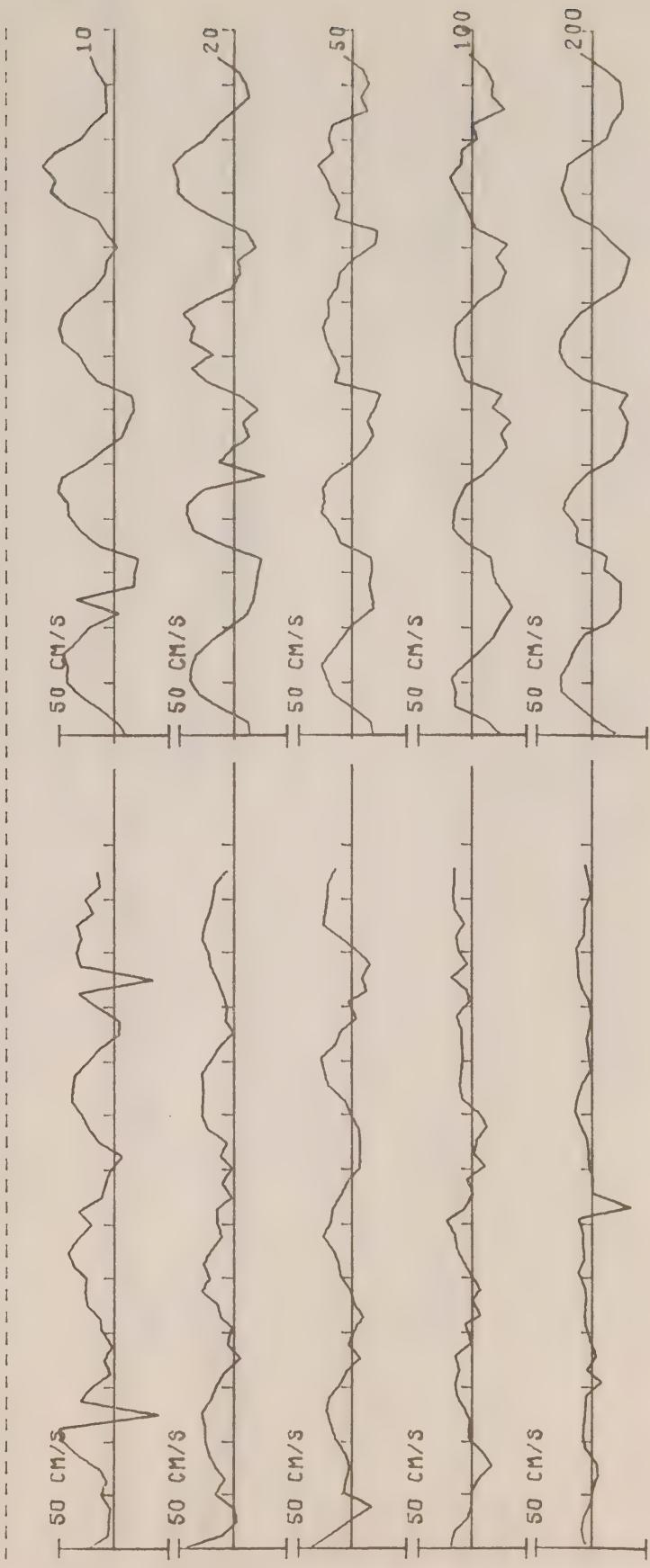
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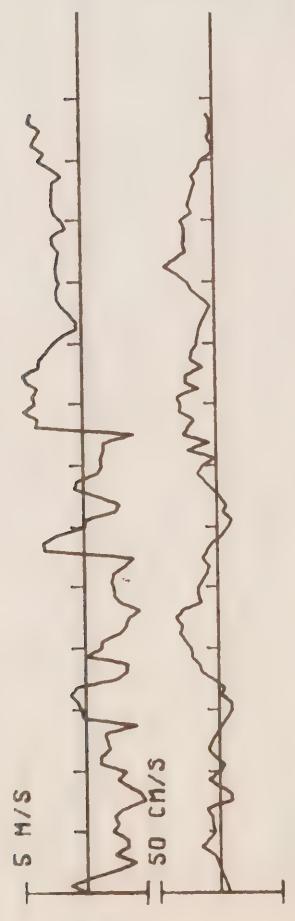


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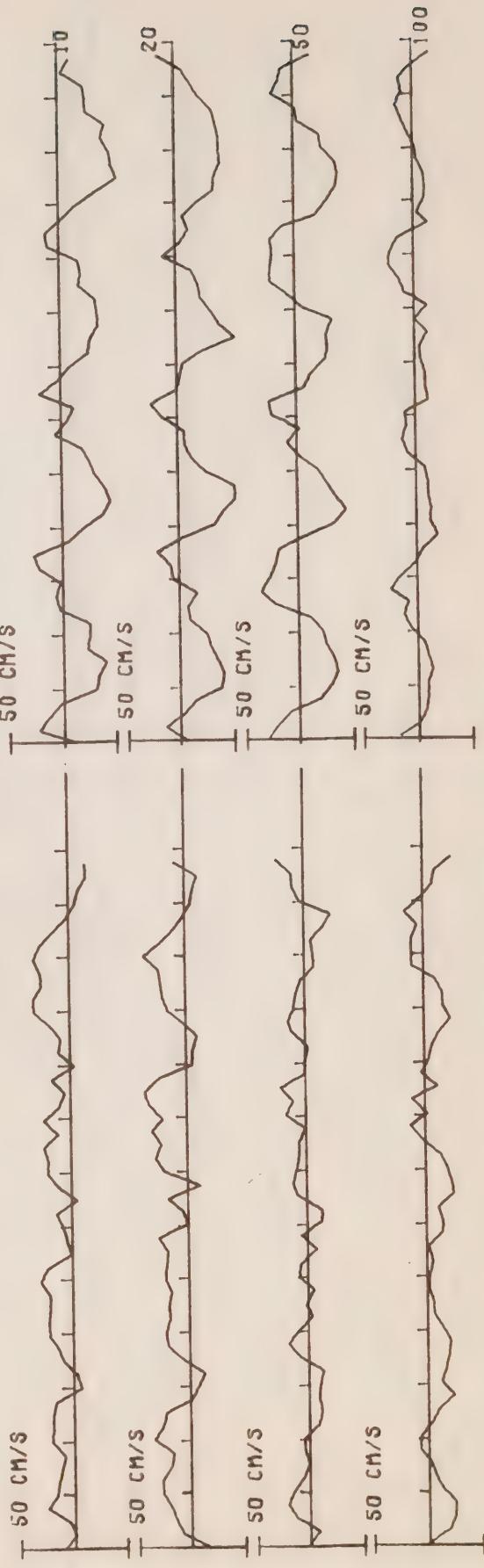
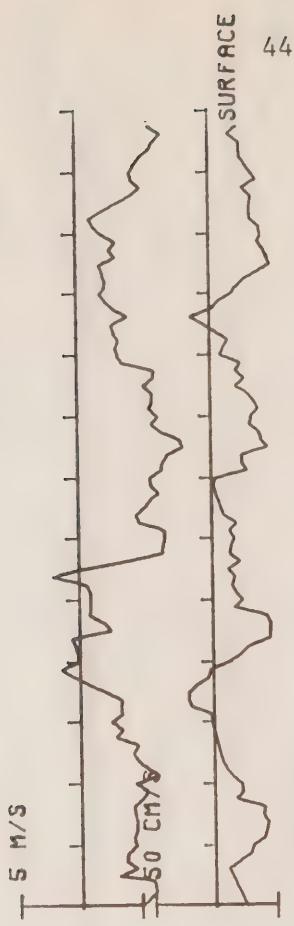


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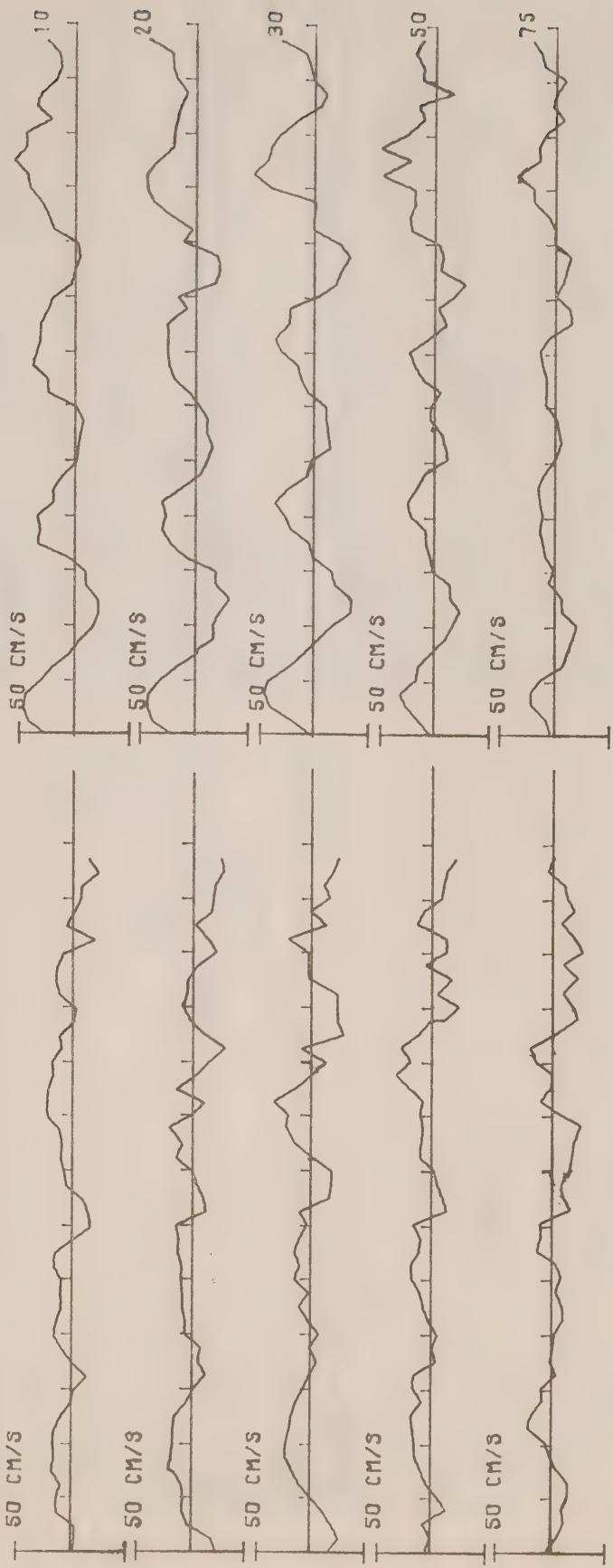
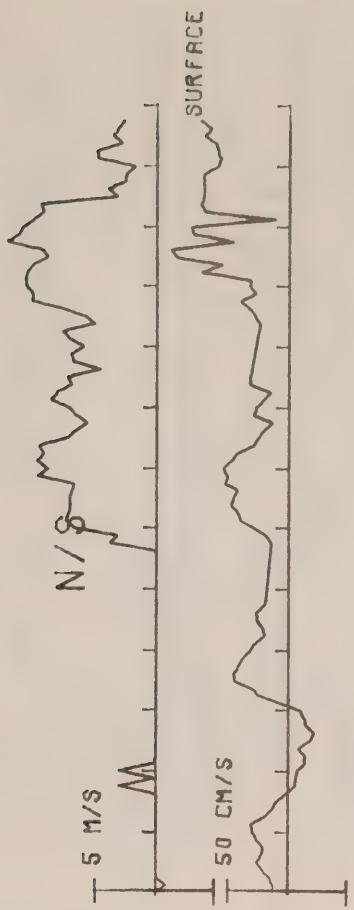
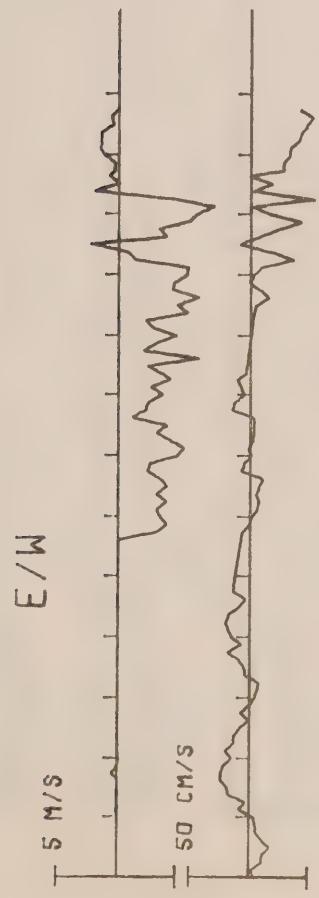
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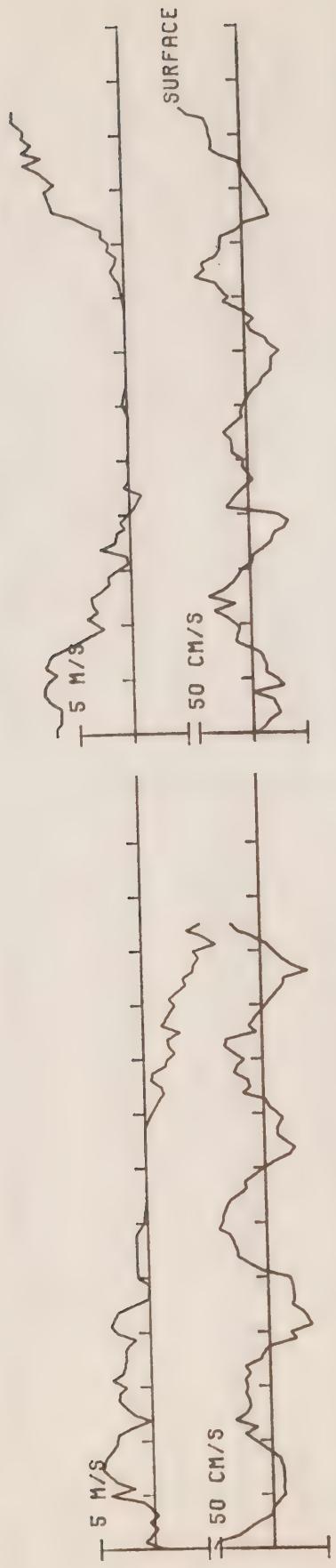
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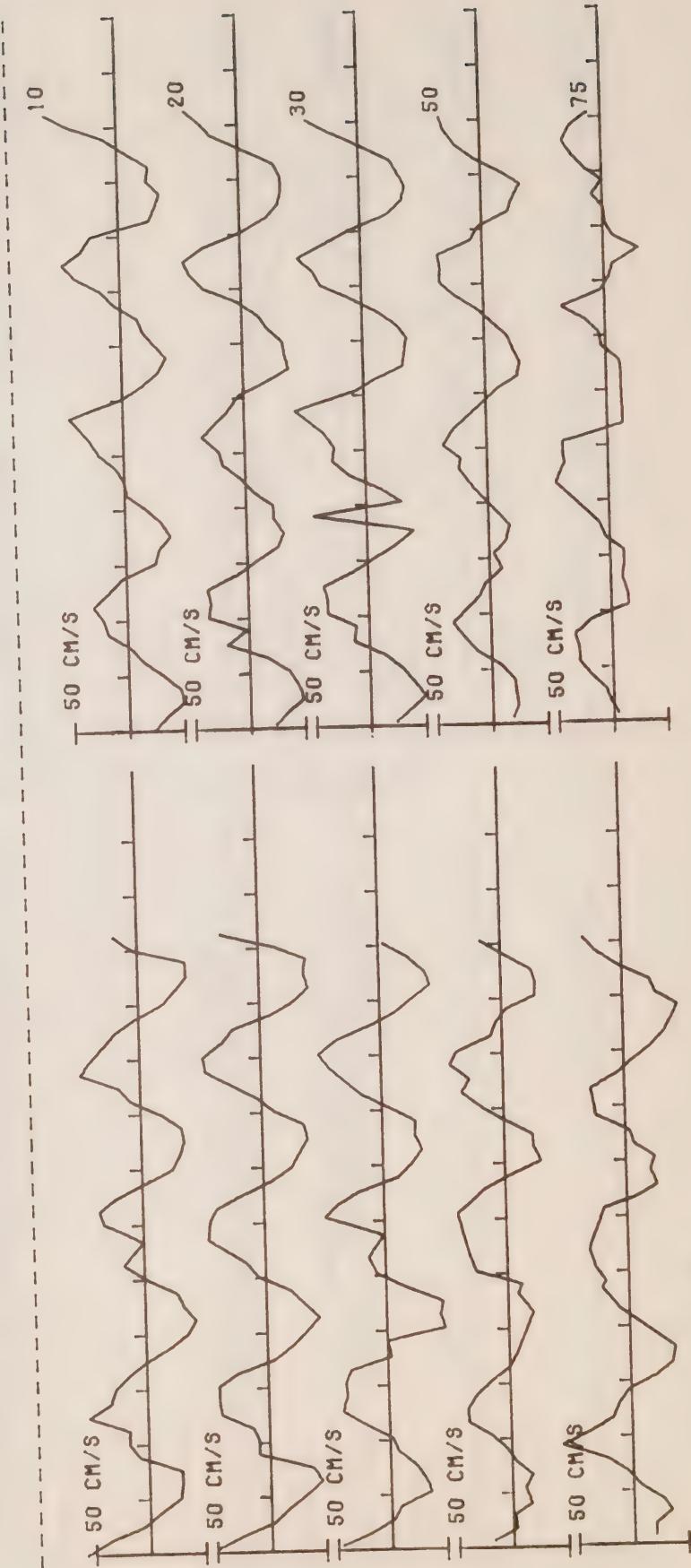
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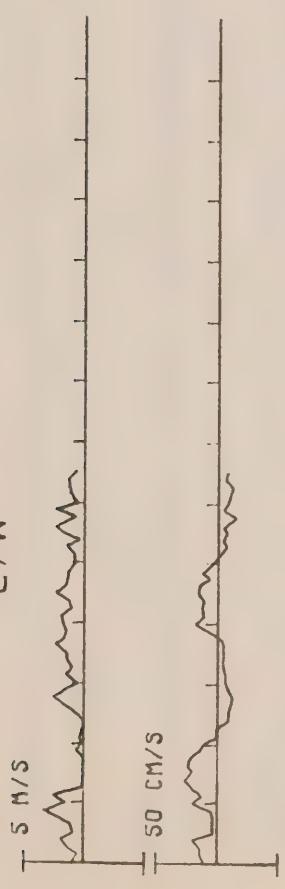
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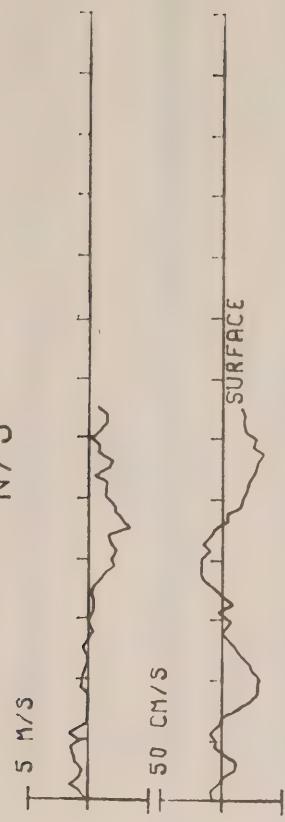
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E/W



N/S



50 CM/S

50 CM/S

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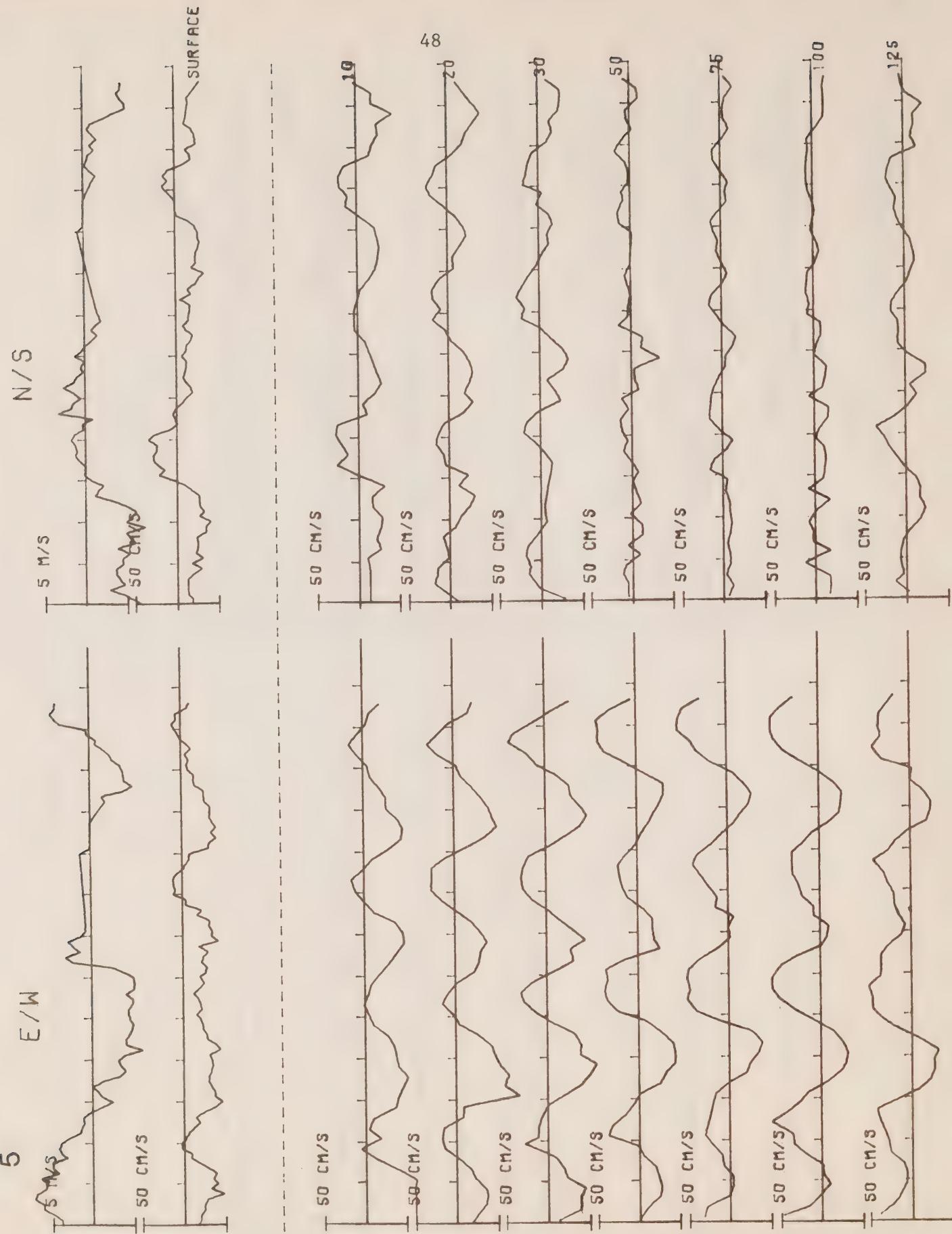
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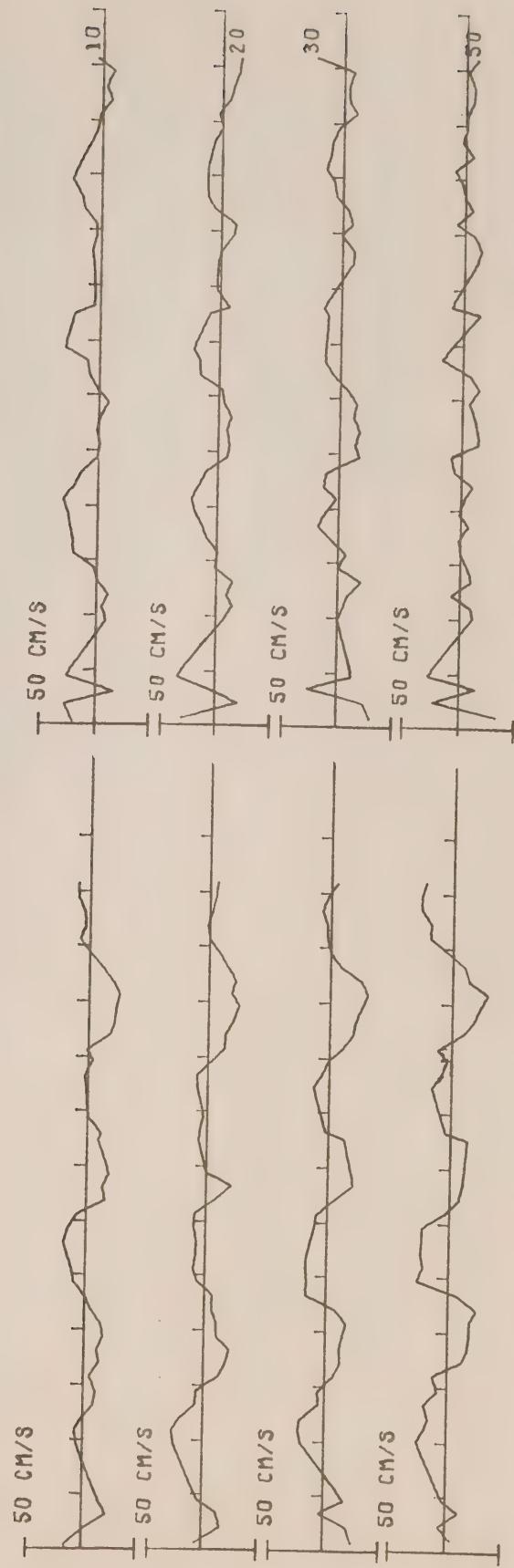
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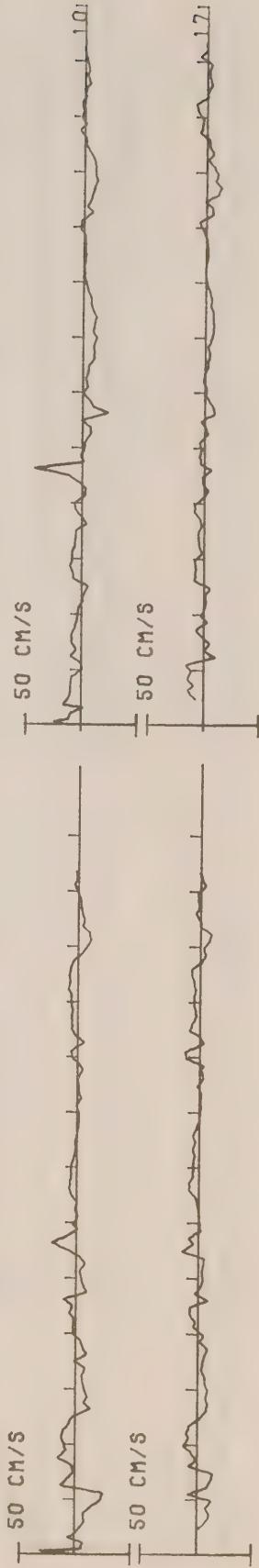
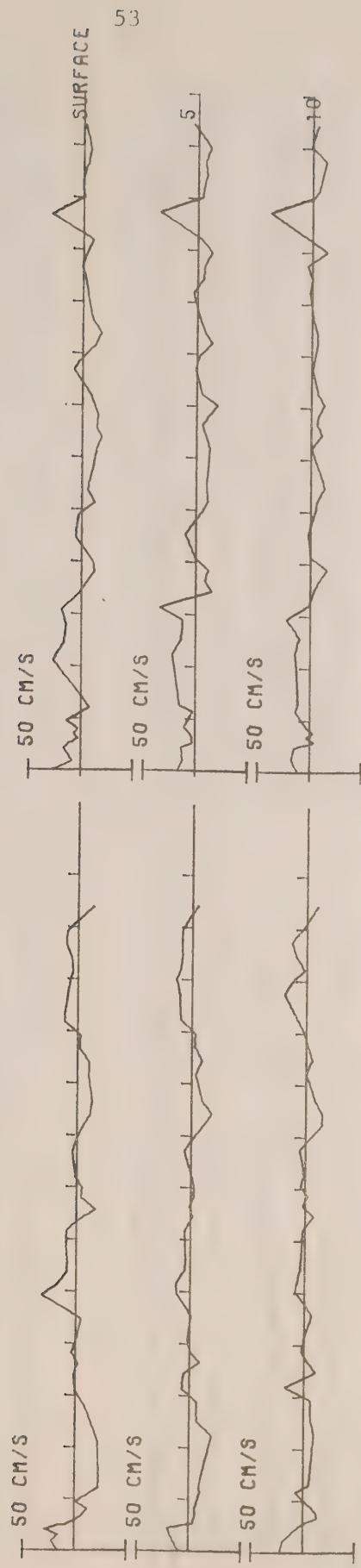


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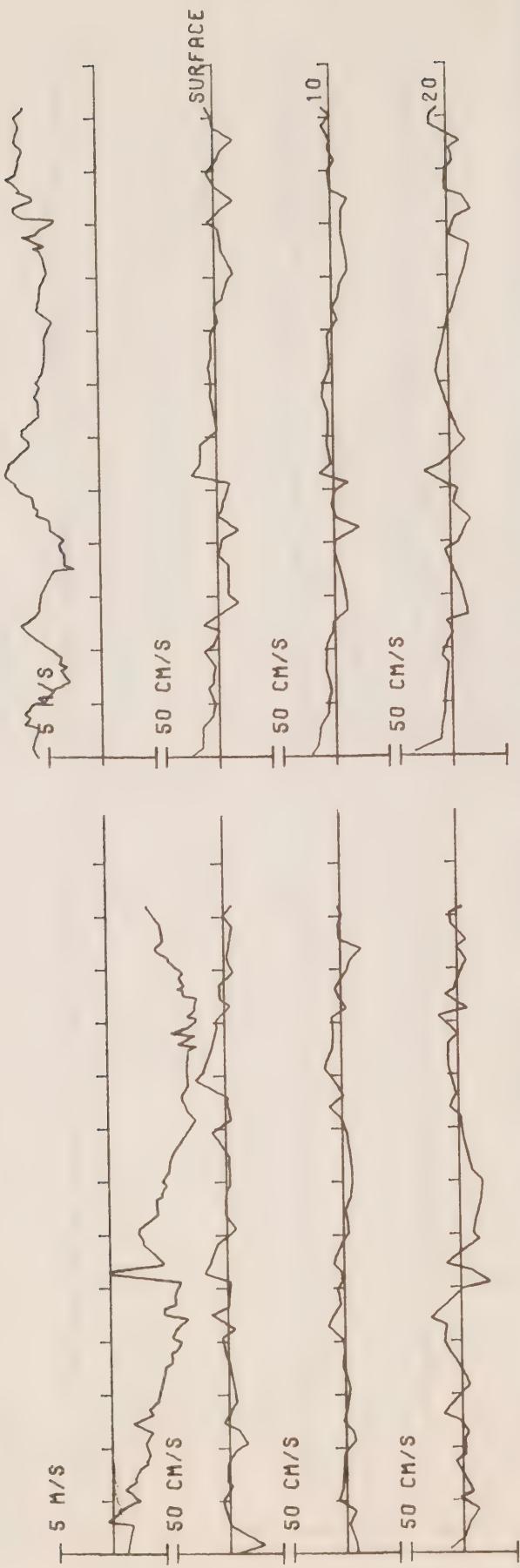
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E/M

S/Z

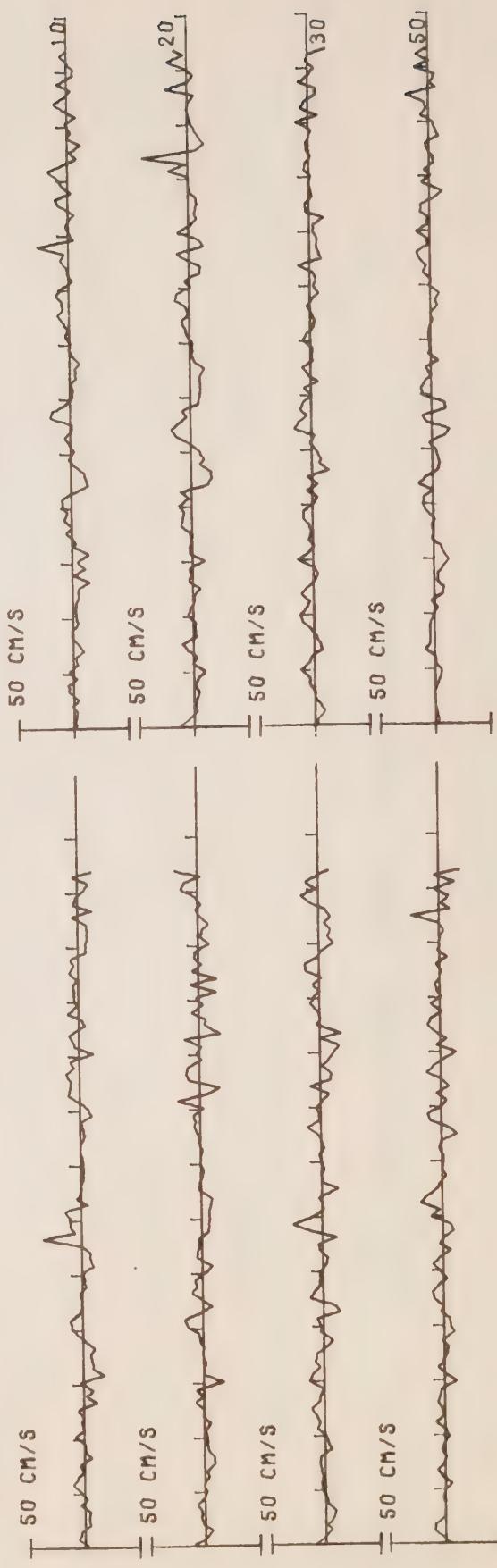


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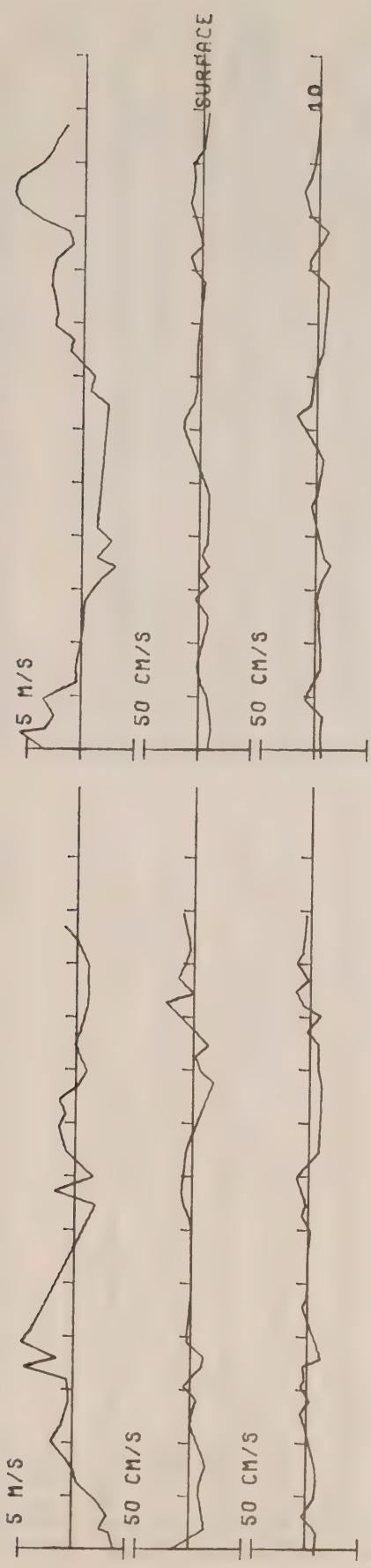
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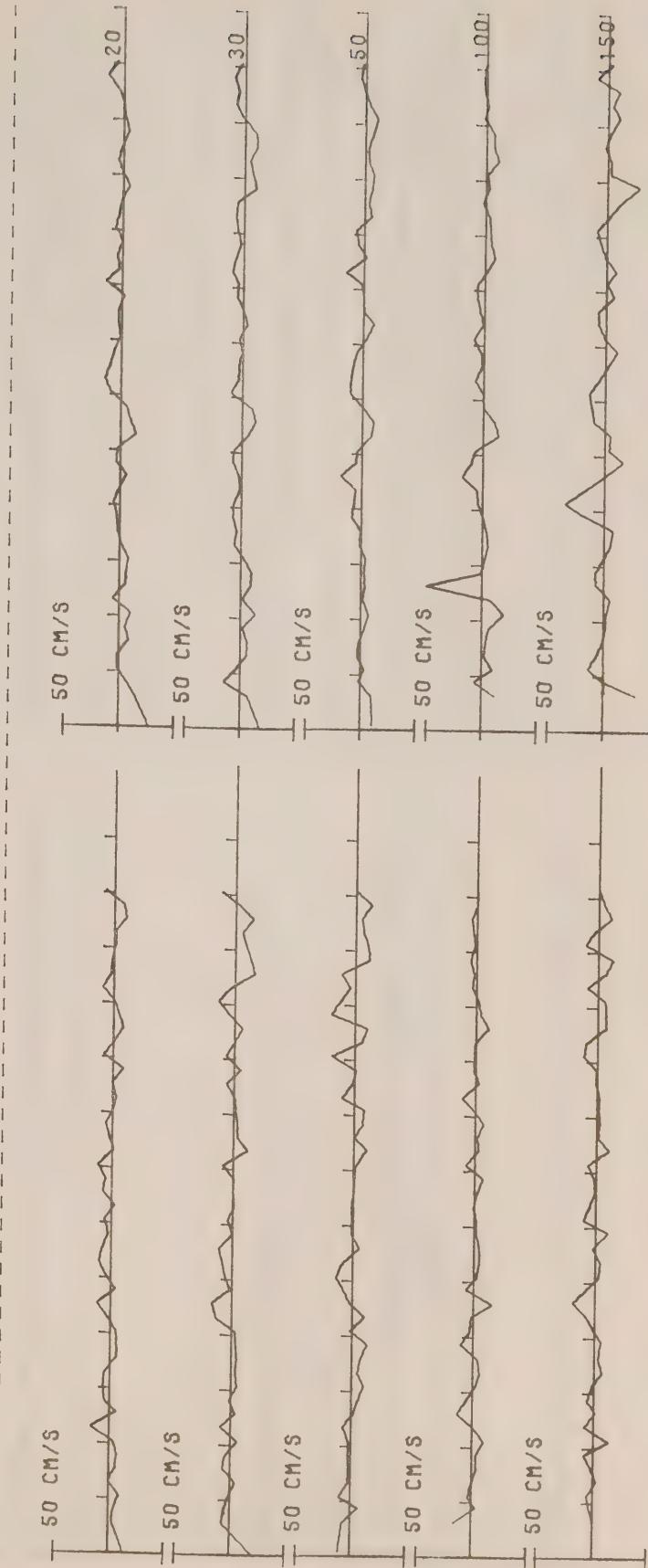
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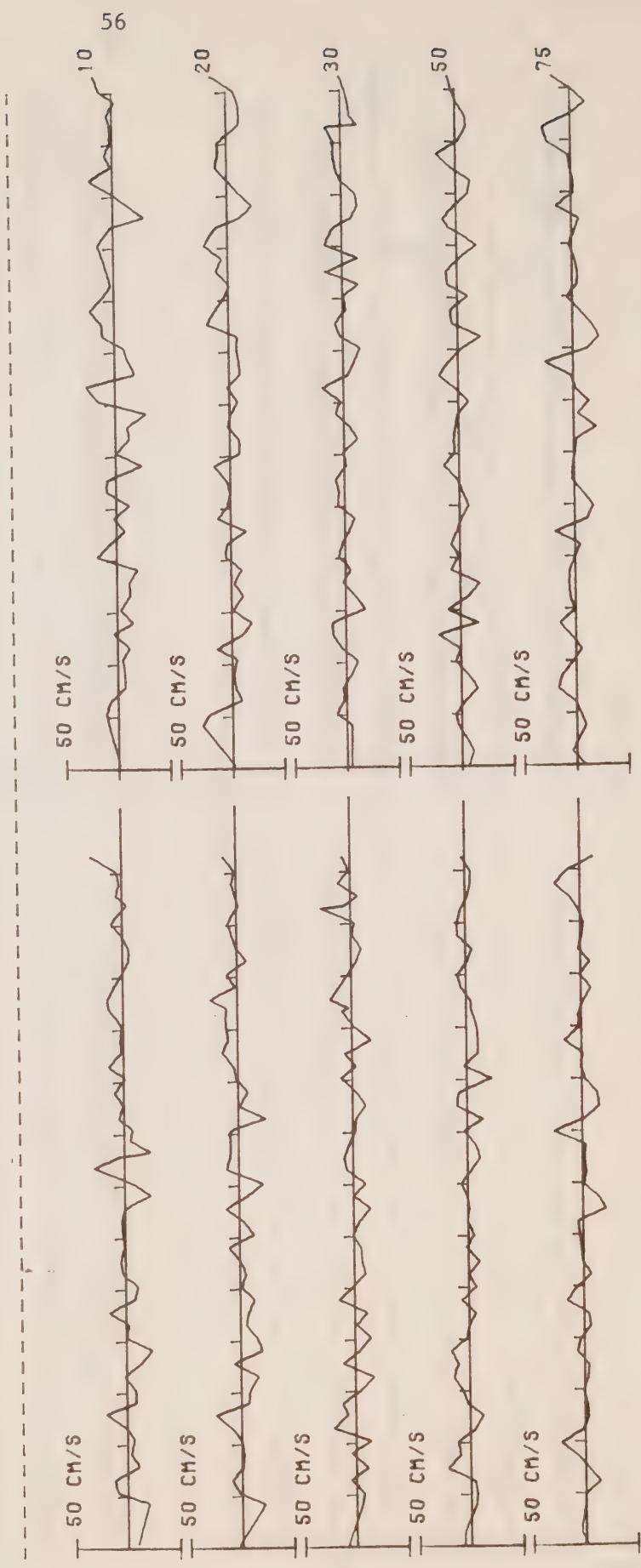
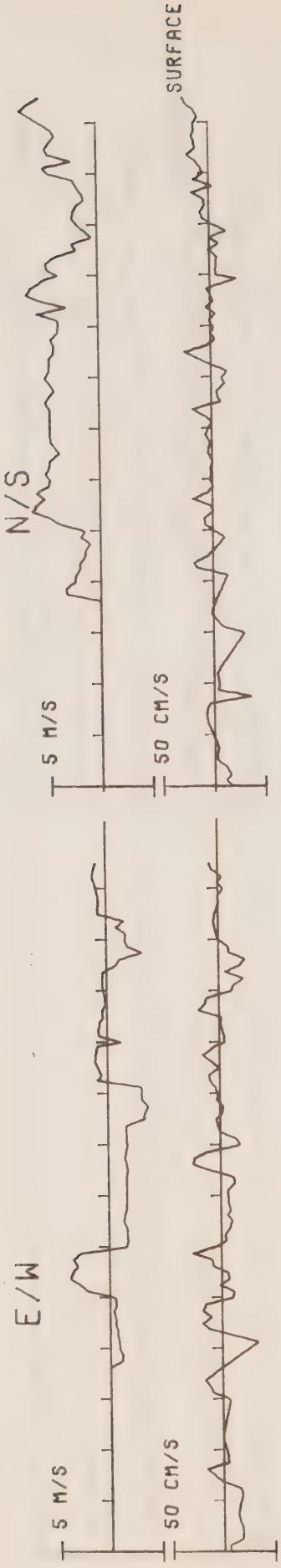
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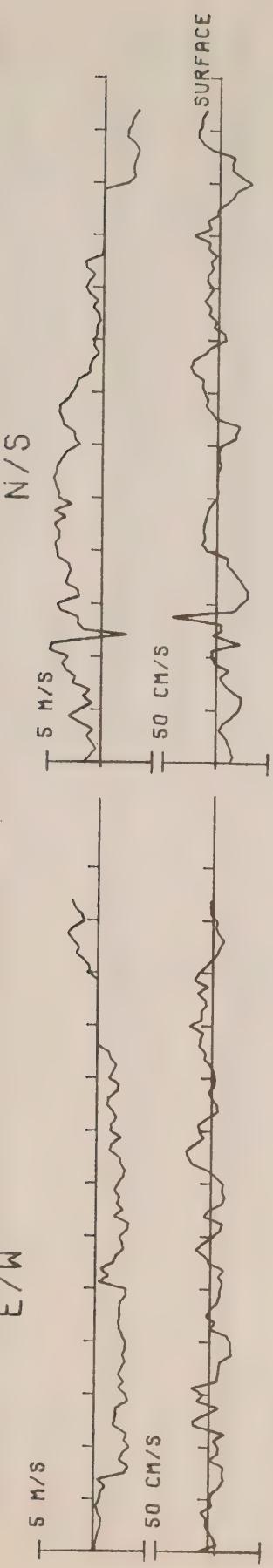


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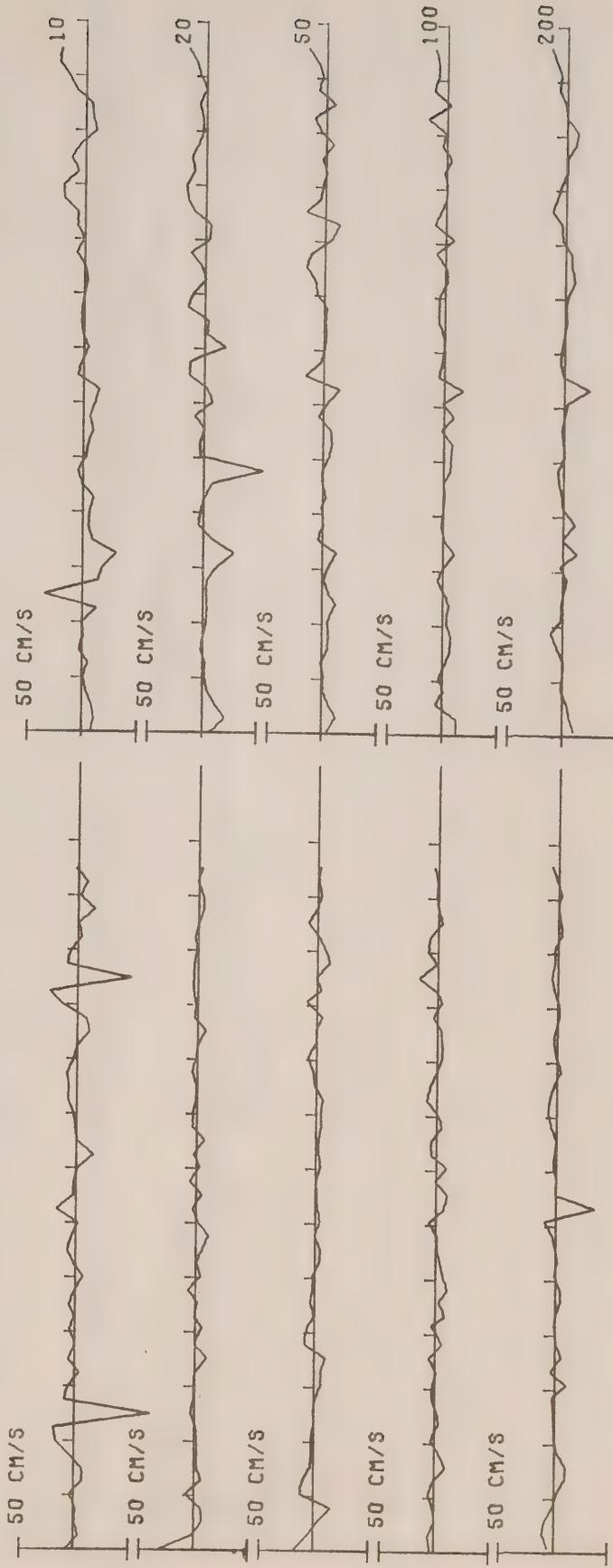
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S/Z

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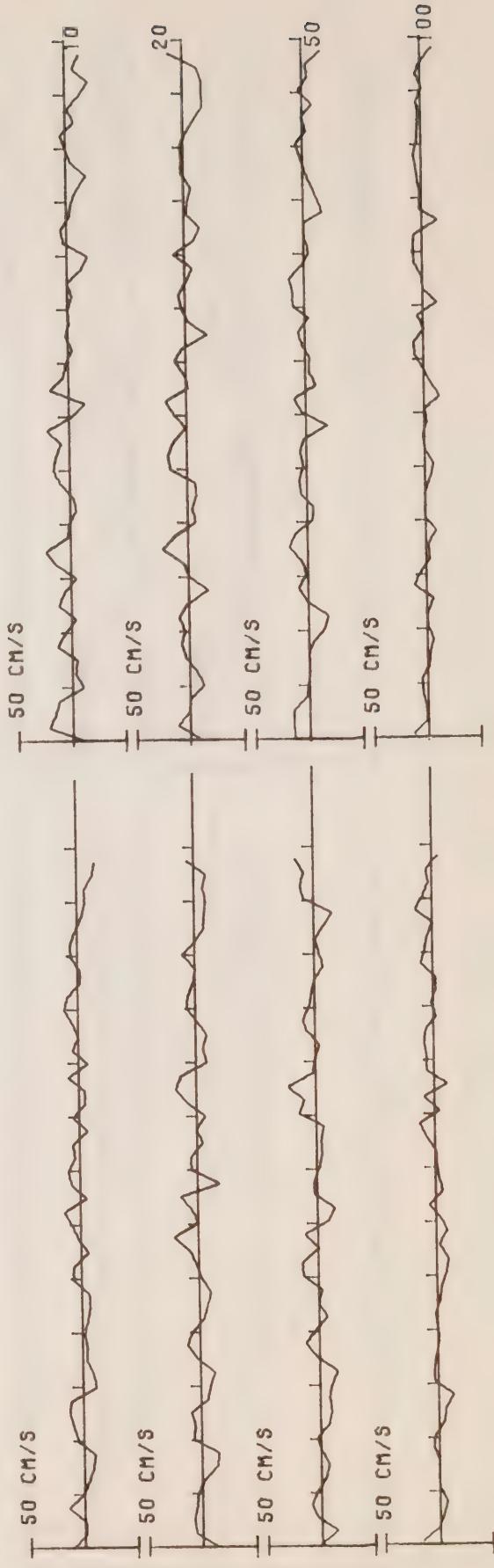
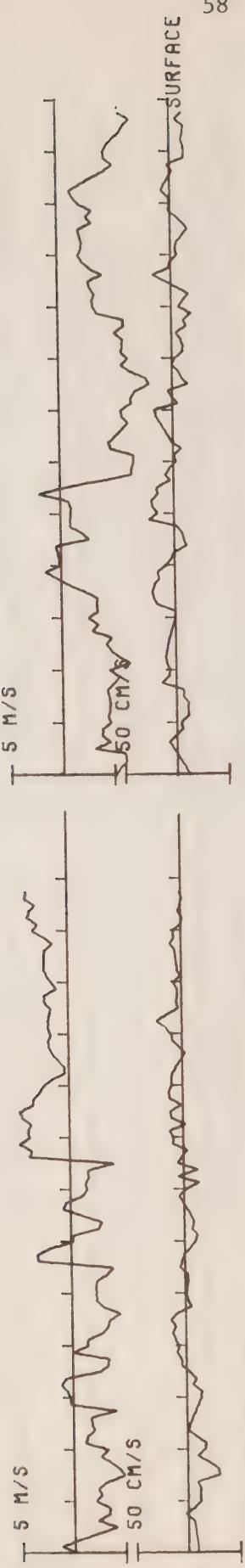
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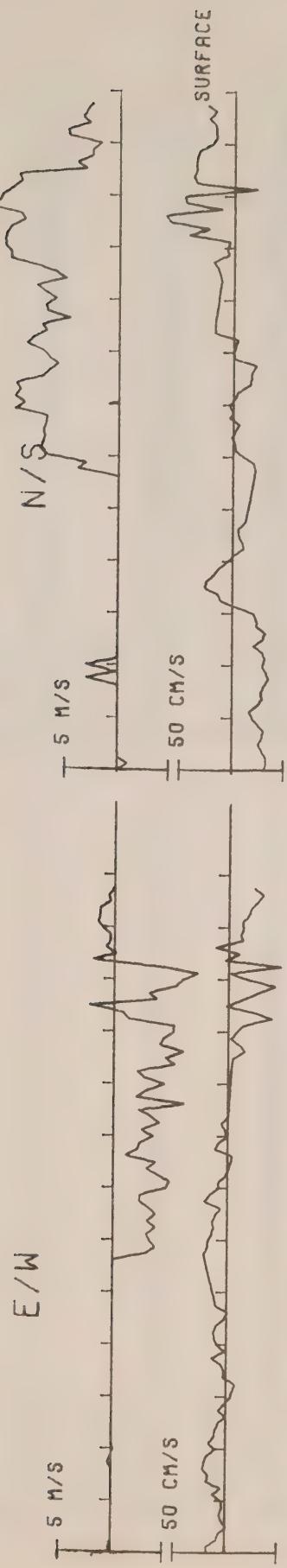
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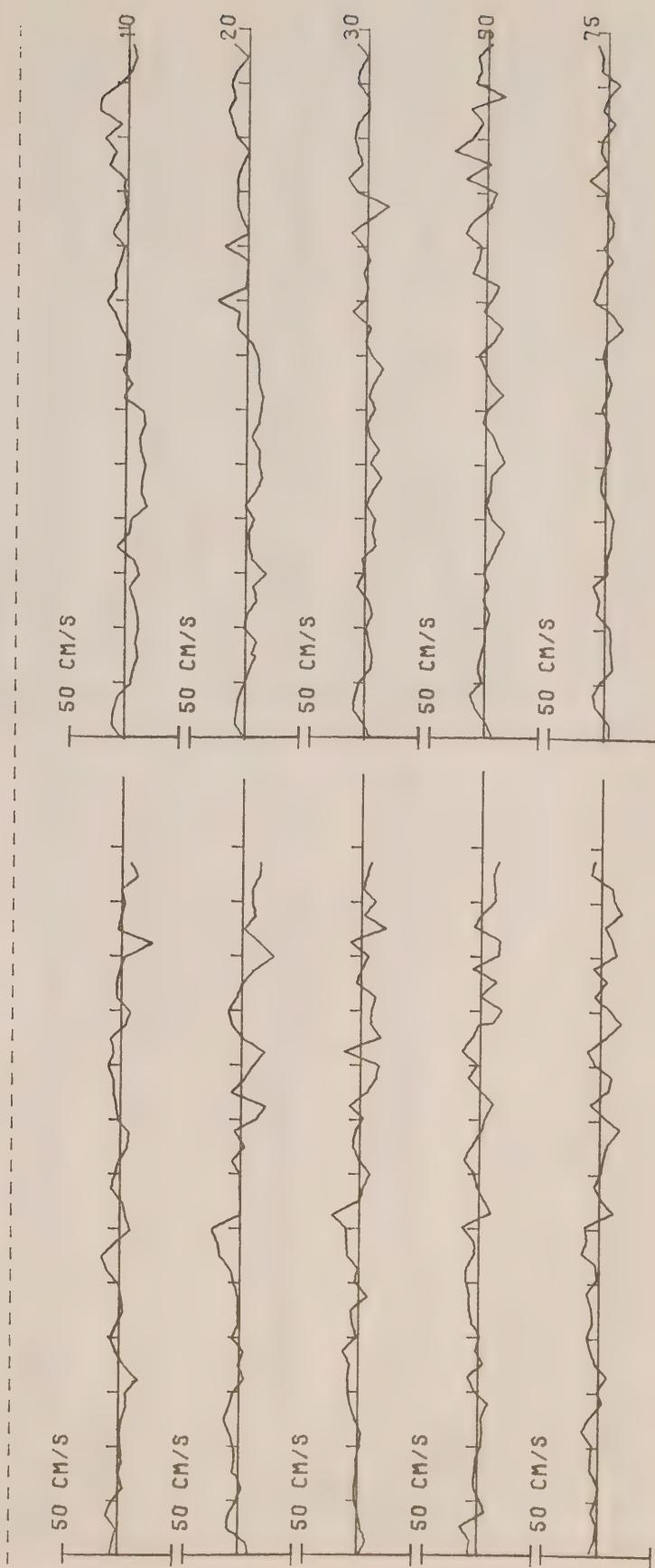
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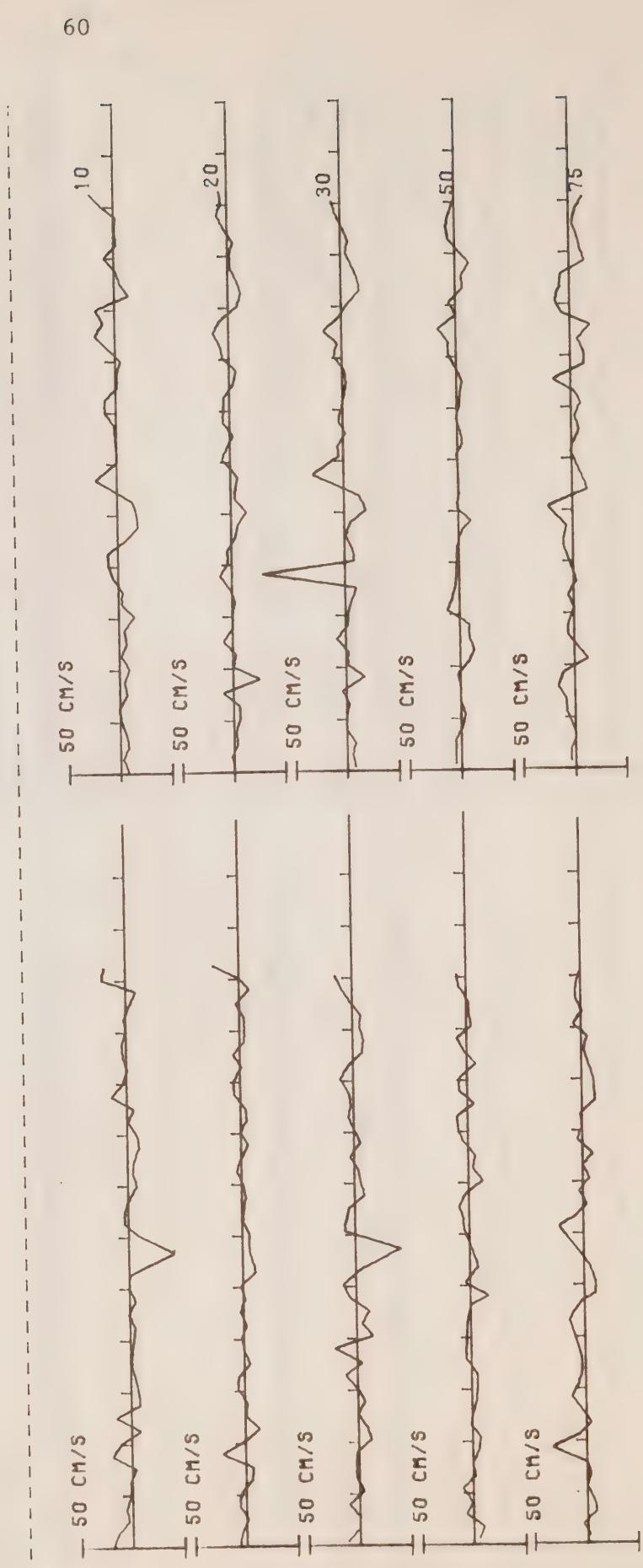
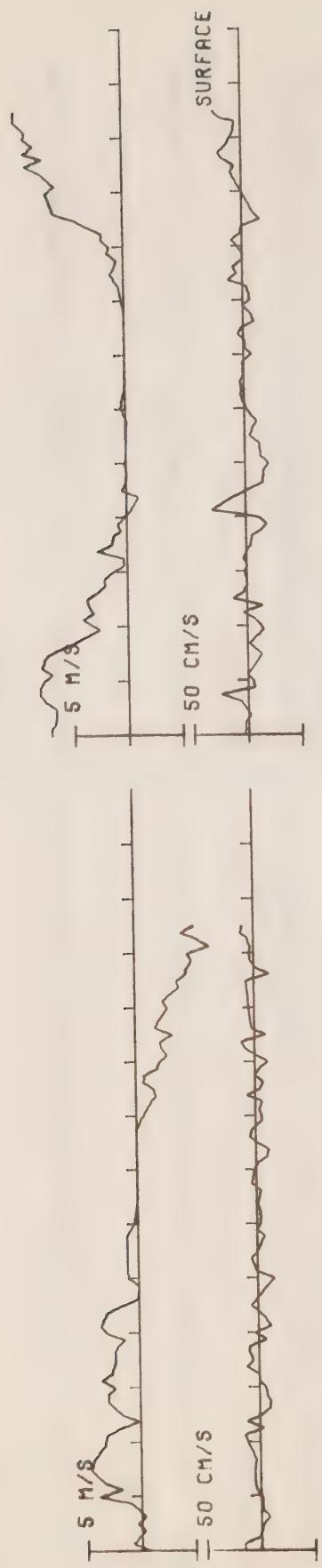
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N/5

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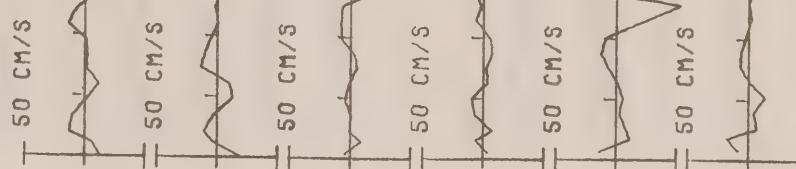
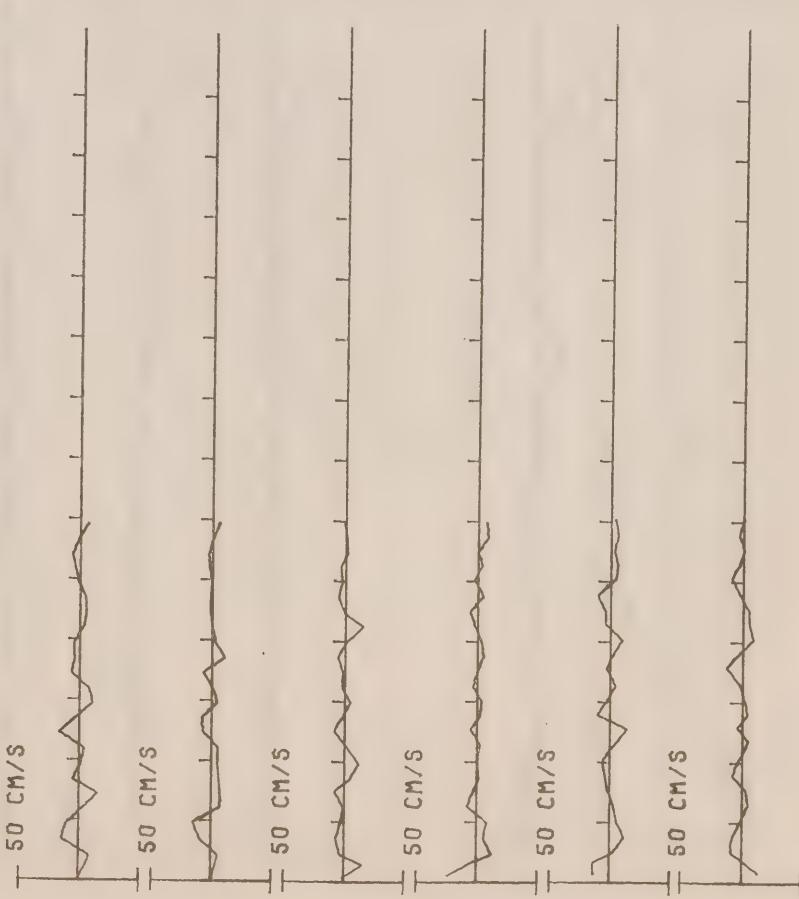
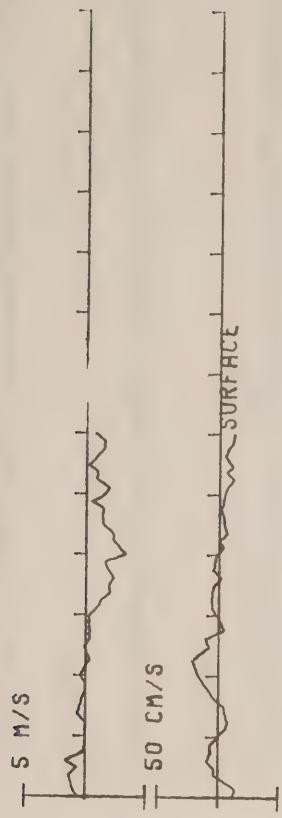
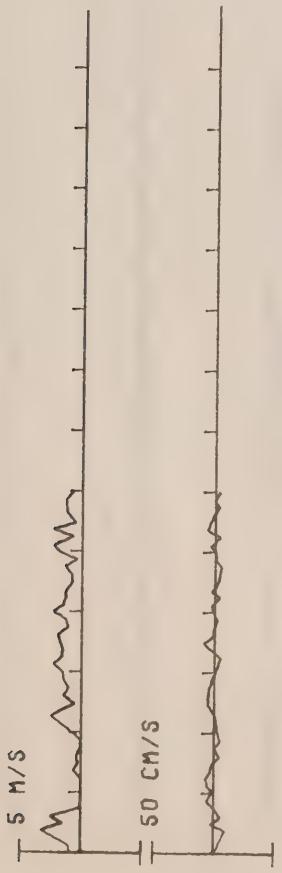
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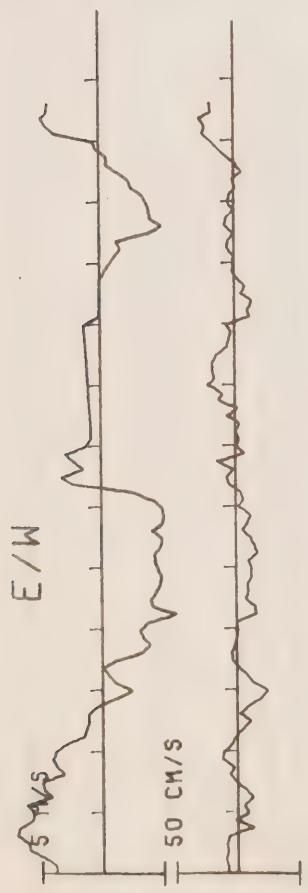
14

E/W

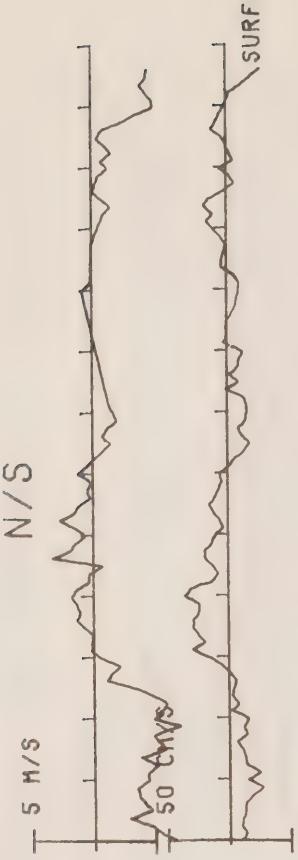
N/S



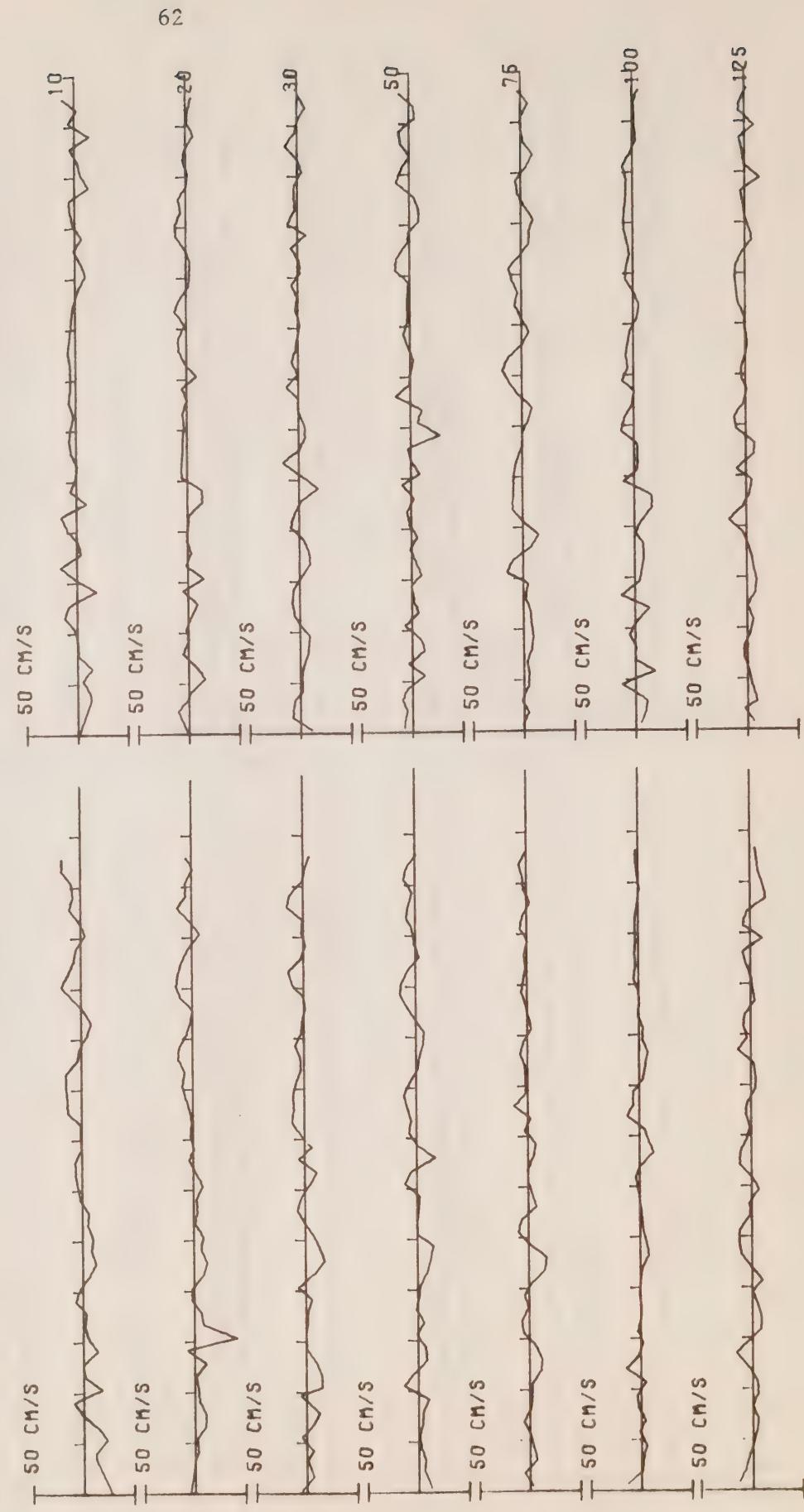
5



N/S



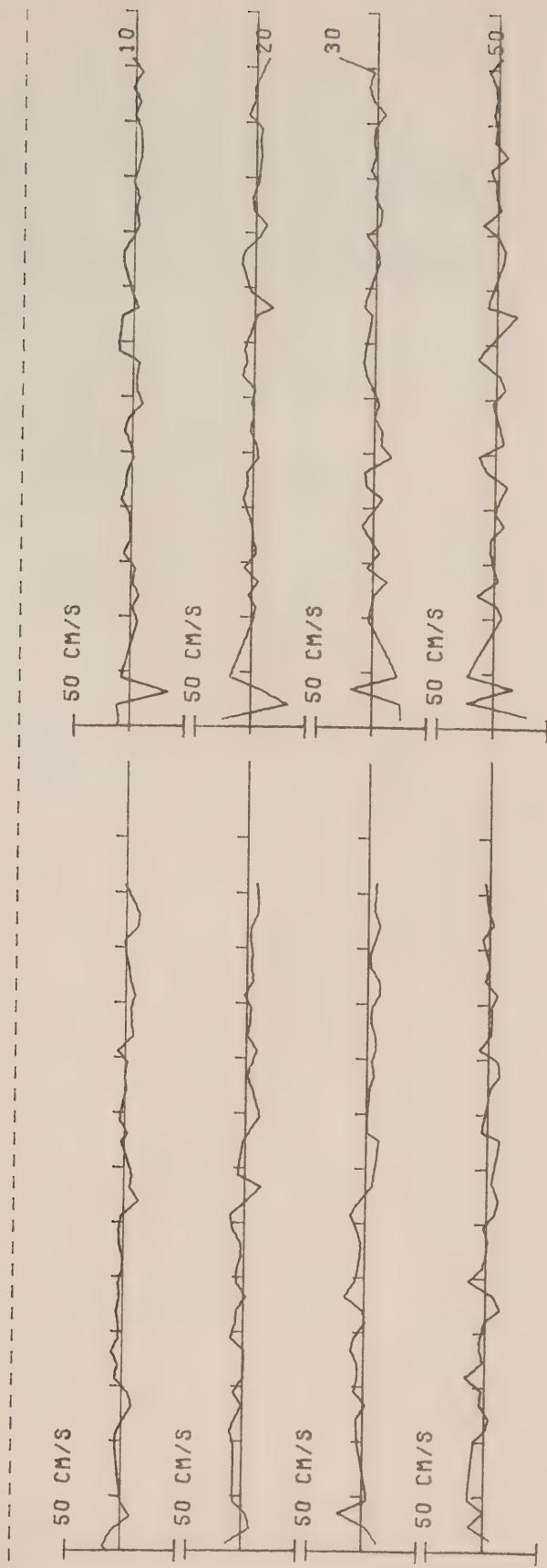
SURFACE



T

E/W

N/S



Appendix B. Listings of tidal current constituents.

Listings are for stations and depths having durations of one tidal cycle or longer. Listed for the two tidal current constituents are amplitudes of the major and minor axes, orientation of major axis relative to east and phase lag (γ) relative to 120° west longitude. If minor axis is positive, the current vector rotates counterclockwise; if negative, rotation is clockwise.

B1. Listing of mean current versus station and depth. Columns 1 and 2 are derived from drogue measurements, others from Ekman current meter measurements. Top value in each row is east-west component in cm/s; second value is north-south component in cm/s.

Depth	44	STATION						T
		43	42	65	I-3	I-2	I-1	
0	0.88	-1.07	3.54	7.42	17.61	11.61	-3.63	6.52
0	1.19	7.09	-4.52	7.50	21.01	-20.90	30.32	3.94
10	*0.40	-0.48	4.03	-	-	-	-	-29.59
	-0.65	3.11	-6.40					-11.90
10	0.77	2.57	-	11.45	18.45	12.84	6.57	3.88
	1.51	4.09		-0.56	21.94	-18.30	18.21	-0.64
20	-0.85	-2.47	-1.81	5.89	16.01	15.33	0.51	5.16
	0.88	-3.27	-7.72	-1.45	12.63	-17.89	10.83	-0.50
30	-	-4.19	0.43	4.55	-	-	1.80	3.30
		-7.72	-6.85	-5.83			8.65	4.46
50	-	-0.39	0.59	2.73	8.17	2.71	4.93	9.60
		-5.03	-15.28	-3.79	5.73	-7.12	7.14	4.35
75	-	-	-	3.75	-	-	-5.20	0.41
				-5.40			4.08	7.19
100	-	-	-4.48	5.86	-7.82	-	-	-9.09
			-0.11	-6.70	-0.23			15.62
150	-	-	-0.97	-	-	-	-	0.55
			1.22					*
200	*5 m	-	-	-	4.29	-	-	125 m
					-2.08			-

B2 Listing of semidiurnal currents for observations taken in 1954. Columns 1 and 2 are derived from drogue measurements; others from Ekman current meter measurements. Top pair of values give major and minor axes in cm/s; second pair of values give inclination of major axis clockwise from east and phase lag of current relative to 120° W longitude (angles in degrees). If minor axis negative current rotation is clockwise; if positive, rotation is anticlockwise.

STATION		Depth (m)	44	43	42	65	I-3	J-2	I-1
0	55.5, -1.3 -44, 20	36.0, -10.7 -26, 183	22.4, -2.9 -66, 72	25.1, 2.2 -16, 133	29.6, -12.7 -.74, 135	18.3, -3.0 -61, 215	9.4, -5.4 54, 272		
10	53.0, -0.6 -42, 139	37.3, -12.5 -31, 186	20.1, -3.5 -64, 75	-	-	-	-		
10	46.7, 0.2 -50, 138	35.4, -14.9 -30.3, 187	-	29.6, 0.8 -21, 133	28.4, -4.4 88, 152	25.8, 8.0 -65, 232	22.1, 6.5 -66, 65		
20	44.2, 2.1 -48, 135	37.3, -8.9 -33.6, 182	26.0, 1.3 -79, 76	29.0, -2.0 -18, 135	30.4, -4.5 -89, 137	25.1, 9.6 -68, 222	25.8, 8.3 -74, 231		
30	-	40.1, -10.2 -40, 185	27.6, 2.0 -80, 248	28.8, -10.2 -18, 140	-	-	30.5, 4.5 -71, 75		
50	-	40.4, -2.7 -39, 176	23.7, 3.0 -80, 236	27.9, -12.0 9, 130	22.5, -4.5 88, 151	30.3, 12.8 -85, 187	17.9, 6.8 -60, 65		
75	-	-	-	34.4, -14.2 41, 114	-	-	14.2, 8.4 -53, 60		
100	-	-	25.2, 2.6 -80, 240	-	23.6, -4.2 -86, 118	15.8, 10.9 51, 126	-		
150	-	-	25.6, 2.4 -80, 243	-	-	-	-		
200	-	-	-	-	29.6, -4.3 -87, 123	-	-		

B2 Listing of semidiurnal currents for observations taken in 1955. Column 1 is derived from drogue measurements; others from Ekman current meter observations. Top pair of values give major and minor axis in cm/s; second pair of values give inclination of major axis clockwise from east and phase lag of current maximum relative to 120° W longitude (angles in degrees). If minor axis is negative current rotation is clockwise; if positive, rotation is anticlockwise.

Depth (m)		STATION		T
		9	14	
0	31.8, -23.6	19.4, 53 ,	-11.1 93	19.6, 0.6 -40 , 85
	29 , 25			-
10	53.7, 5.1	50.7, -1.4 23 , 81		32.0, 4.0 -36 , 102
	48 , 148			24.6, 3.1 -32, 124
20	54.3, 5.2	48.1, 2.4 14, 83		33.8, -1.3 -40, 109
	49 , 148			25.3, 0 -34 , 128
30	55.3, 7.3	46.7, 13.0 3 , 83		31.1, -7.9 -35, 118
	50 , 151			23.2, -2.7 -26, 132
50	47.1, -5.9	46.8, 17.4 5 , 84		26.5, -1.3 -13, 108
	40 , 136			21.8, -2.1 -16, 130
75	36.1, -23.5	47.6, -15.4 -1, 323		25.8, -2.7 -1, 108
				-
100	-	49.3, -30.8 24 , 66		26.0, -4.7 -7 , 109
				-
125	-	-		30.9, 3.0 -33, 104
				-

B3 Listings of diurnal currents for observations taken in 1954. Column 1 is derived from drogue measurements; others from Ekman current meter observations. Top pair of values give major and minor axis in cm/s; second pair of values give inclination of major axis clockwise from east and phase lag of current maximum relative to 120° W longitude (angles in degrees). If minor axis is negative current rotation is clockwise; if positive, rotation is anticlockwise.

Depth (m)	STATION					
	44	43	42	65	I-3	I-1
0	47.4, 4.6	37.1, -4.7	6.5, -3.1	21.0, -3.7	26.8, 1.8	12.5, -7.7
	-45, 183	-25, 193	12, 264	-15, 372	-87, 348	-45, 164
10	45.2, 3.3	38.2, -4.9	7.5, -2.5	-	-	-
	-41, 185	-29, 194	-34, 264	-	-	-
10	11.8, -1.3	12.9, -9.6	-	7.9, 0.7	3.4, -1.5	6.8, 0.4
	-47, 328	89, 219	-	-25, 157	65, 235	-78, 232
20	10.7, -2.6	11.8, -9.5	3.8, -0.4	9.4, 1.6	2.1, 0	4.1, 1.0
	-44, 335	-79, 205	83, 315	-40, 151	19, 278	-74, 211
30	-	12.2, -8.1	3.4, 0.4	7.5, 2.6	-	-
	-	-56, 353	82, 212	-18, 152	-	-
50	-	10.0, -7.1	1.3, 0.6	8.2, -1.3	2.1, -1.8	4.6, 0.2
	-	24, 291	89, 259	-29, 164	-40, 133	-72, 243
75	-	-	7.2, -1.3	-	-	-
	-	-	-2, 159	-	-	-
100	-	6.0, -0.3	-	2.5, 0.6	2.2, -0.3	2.2, -0.3
	-	85, 317	-	39, 288	-51, 258	-51, 258
150	-	-	-	-	-	-
	-	9.8, 0.2	-	-	-	-
200	-	-	-	-	3.5, -1.0	-
	-	-	-	-	-59, 303	-

B3 Listing of diurnal currents for observations taken in 1955. Column 1 is derived from drogue measurements; others from Ekman current meter observations. Top pair of values give major and minor axis in cm/s; second pair of values give inclination of major axis clockwise from east and phase lag of current maximum relative to 120° W longitude (angles in degrees). If minor axis is negative current rotation is clockwise; if positive, rotation is anticlockwise.

		STATION		
Depth (m)		9	14	5
0		26.5, -0.6 77, 168	14.9, 7.3 23, 359	17.9, -4.8 -63, 223
10		11.4, -5.9 11, 41	11.9, 6.9 -75, 206	19.7, -2.7 -29, 136
20		11.4, -3.9 -10, 50	9.3, 5.2 -47, 240	17.3, 6.0 -3, 131
30		11.2, -7.7 0, 47	7.7, 0.5 -17, 90	17.2, 7.7 -2, 130
50		11.3, -4.0 -8, 50	8.7, -5.3 42, 242	17.6, -0.9 -11, 132
75		11.3, -7.9 -8, 53	7.6, -4.8 18, 260	17.8, -0.9 -14, 132
100		-	9.7, 0.7 41, 275	17.4, 3.3 -6.6, 130
125		-	-	17.7, -1.0 -13, 132

B4 Percentage variance of current due to tidal currents. Top row in each column gives total current variance in (cm/s)². Second row gives percentage of total variance associated with the derived tidal current components (in %).

Depth (m)	44	43	42	65	I-3	I-2	J-1	9	14	5	T
0	2067	816	466	649	890	432	1023	932	377	491	-
	85	73	62	56	65	47	17	83	78	41	
10	1533	988	354	794	874	580	523	1795	572	782	336
	91	88	65	59	60	67	63	87	76	76	68
20	1066	946	475	874	724	619	644	2015	277	996	384
	93	84	76	69	73	67	65	94	58	86	63
30	-	960	574	930	-	-	785	2094	311	1024	442
		89	77	77			80	83	71	88	56
50	-	724	406	984	497	667	467	1127	427	817	458
			86	67	81	79	74	57	91	81	64
75	-	-	-	1440	-	-	-	300	1165	987	759
					84			60	83	73	-
100	-	-	-	509	-	409	275	-	-	1858	860
						71	67		94	88	-
125	-	-	-	-	-	-	-	-	-	734	-
										86	
150	*2061	-	581	-	-	-	-	-	-	-	
	87		67								
200	-	-	-	-	-	377	-	-	-	-	-
							74				

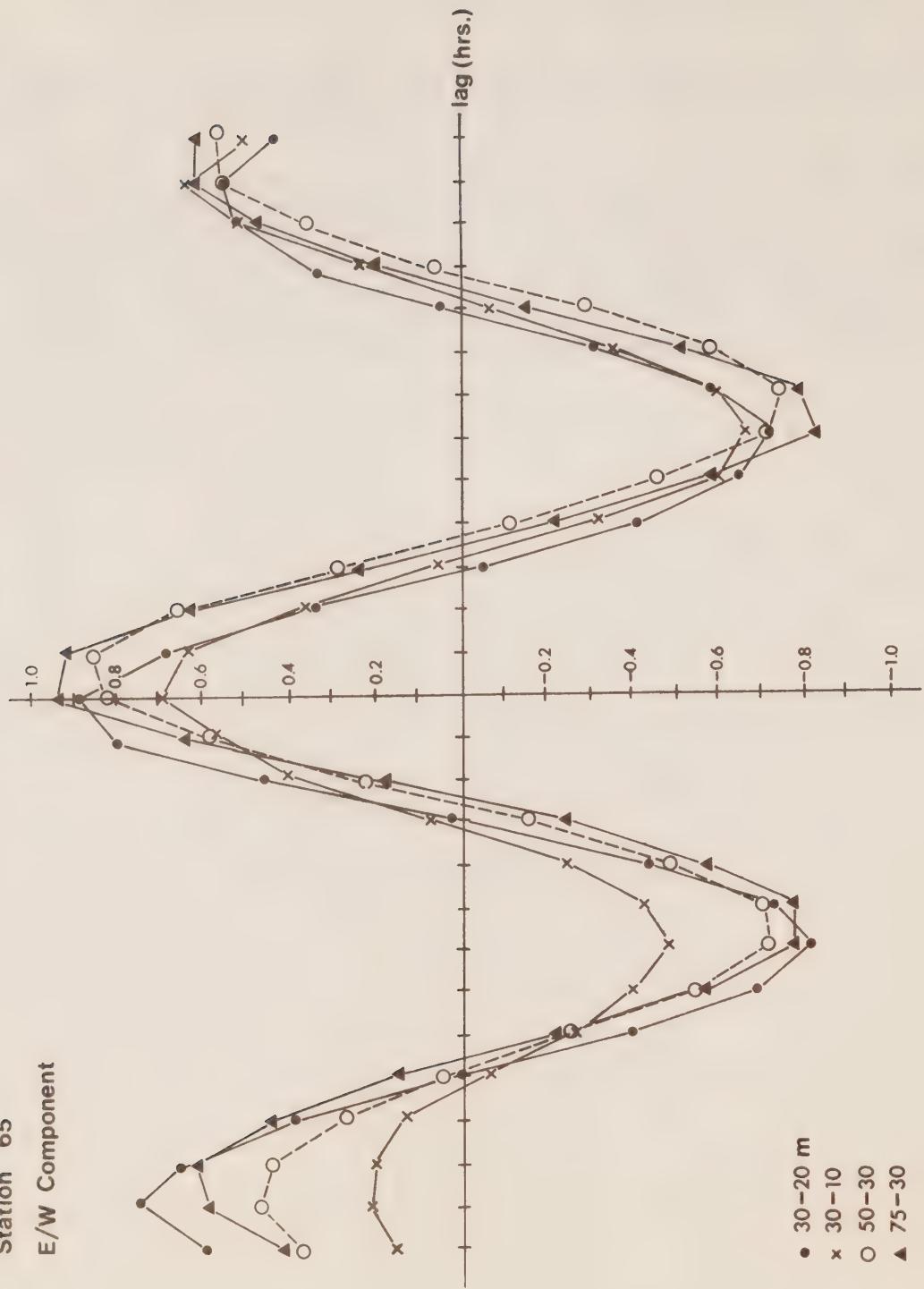
* = 5m

Appendix C. Vertical cross correlation plots for selected stations.

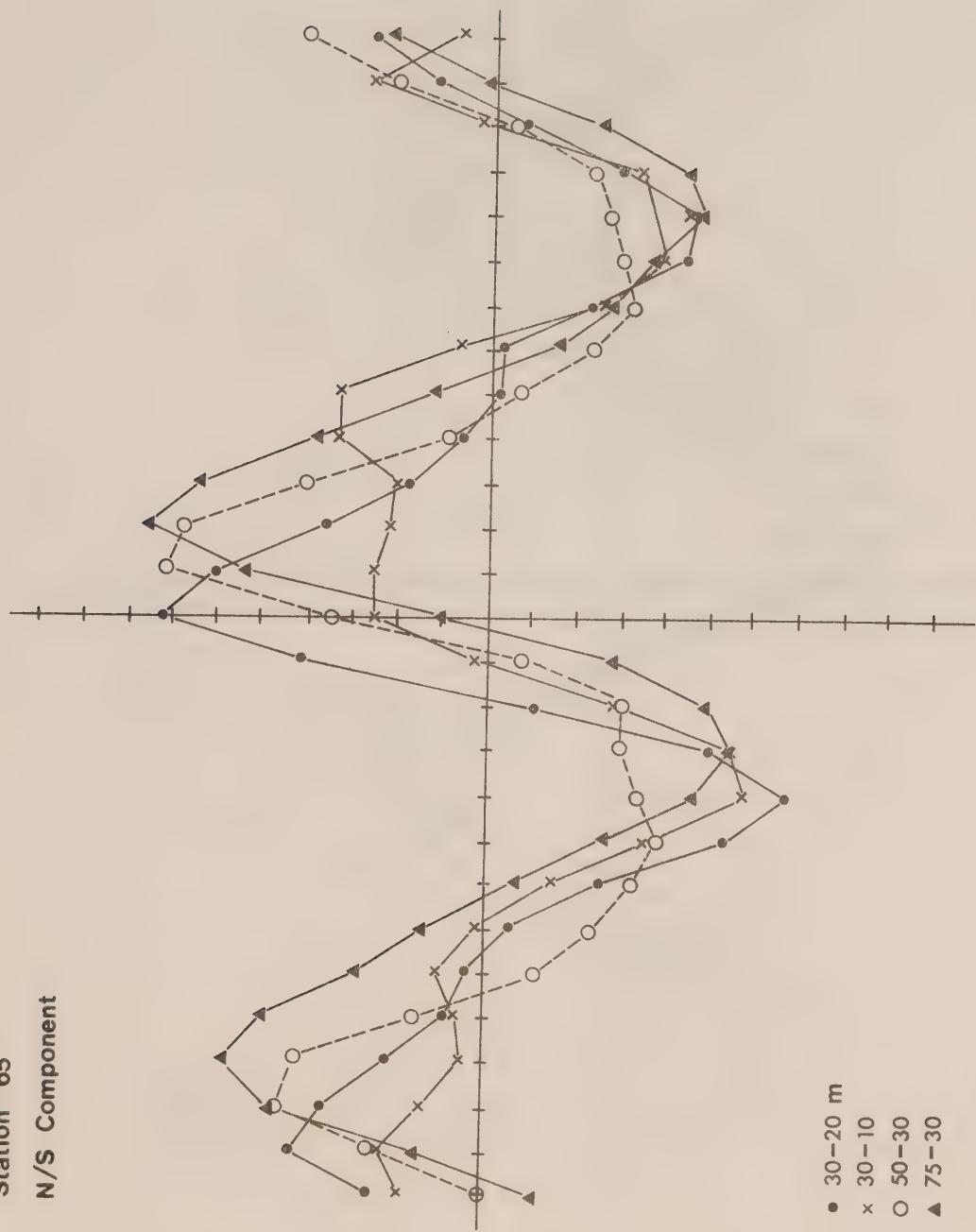
Selected plots of current correlation versus depth. The hourly interpolated current components were used to determine correlations between various depth levels for lag increments of ± 1 hour to a maximum of 13 lags.

For each pair of depths the record at the second depth is held stationary while the record at the first depth is shifted with positive or negative lags. The cyclic variation in the plots results from strong tidal frequency components. If the position of maximum correlation is shifted to positive lags (to the right) then the current component at the second depth level *leads* that at the first depth level; if the position is shifted to negative lags (to the left) the current component at the second depth level *lags* that at the first depth level.

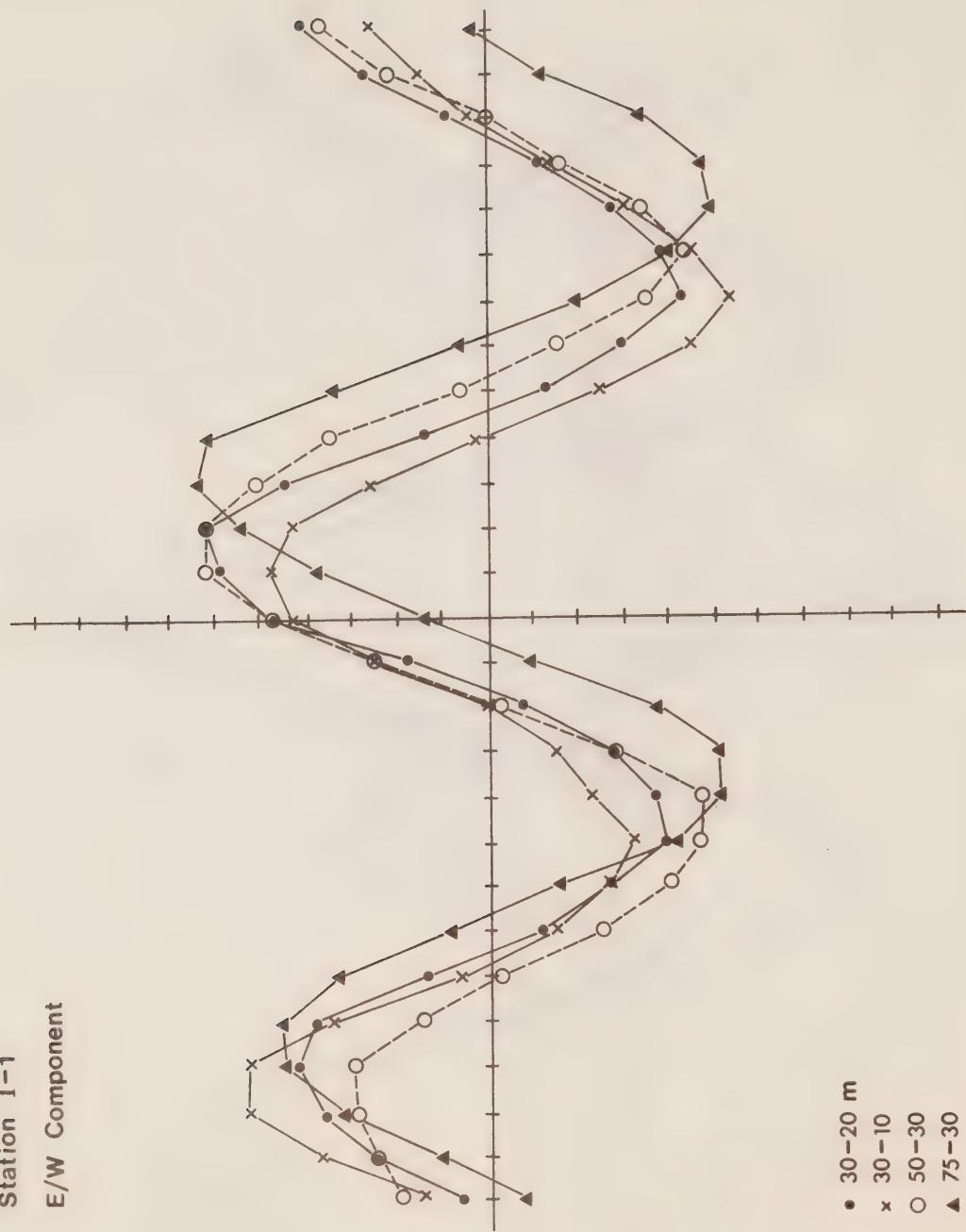
Station 65
E/W Component

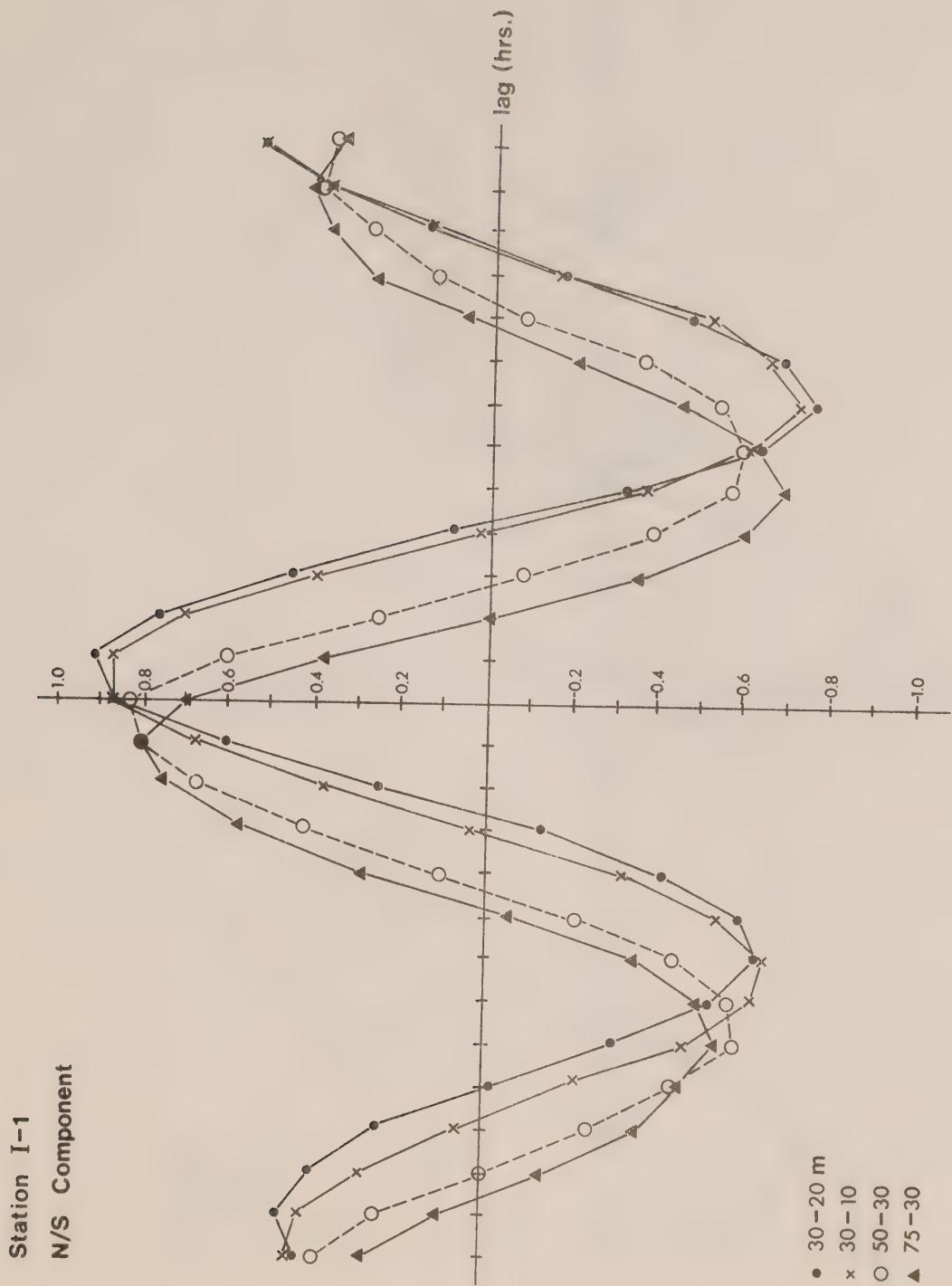


Station 65
N/S Component

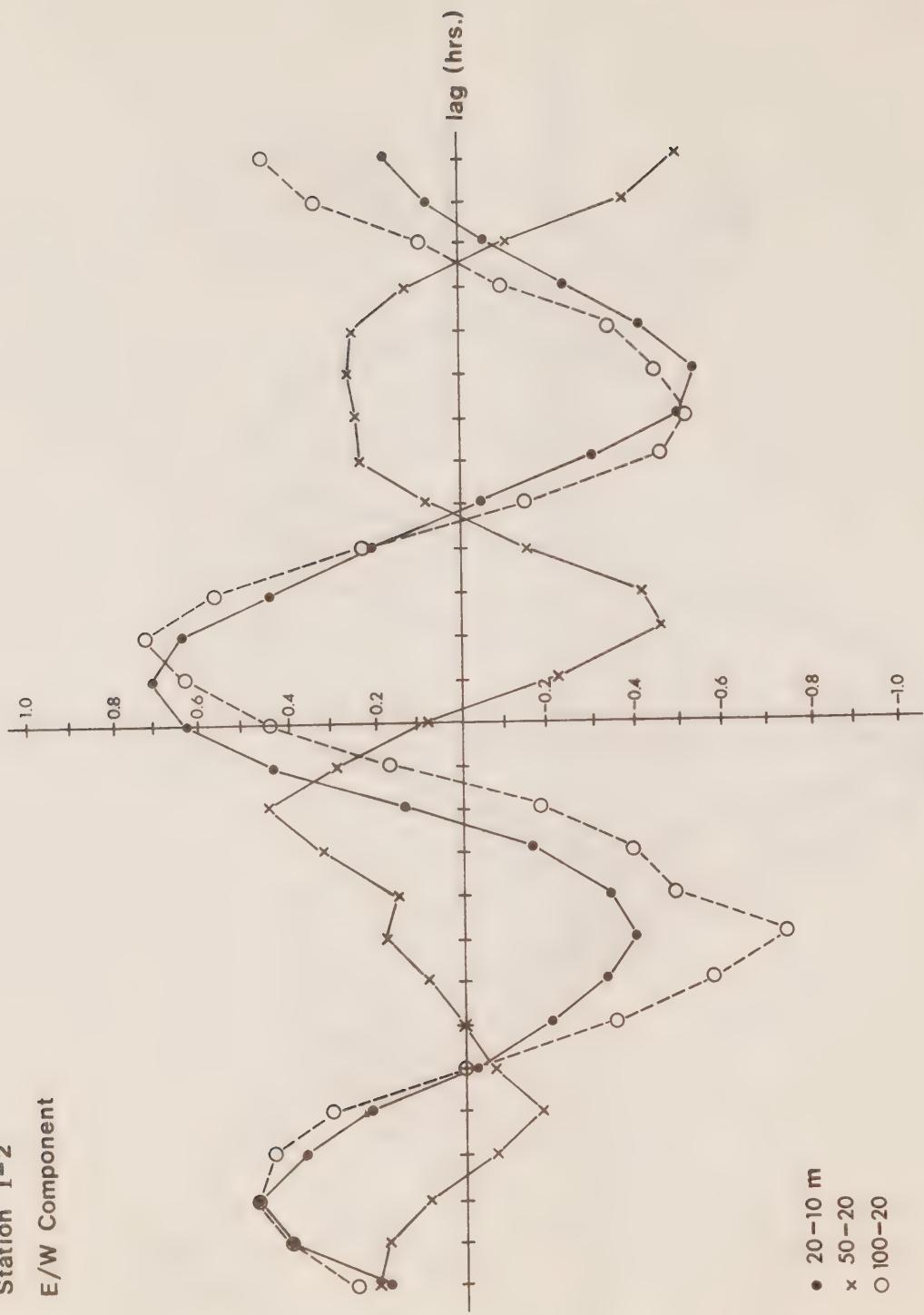


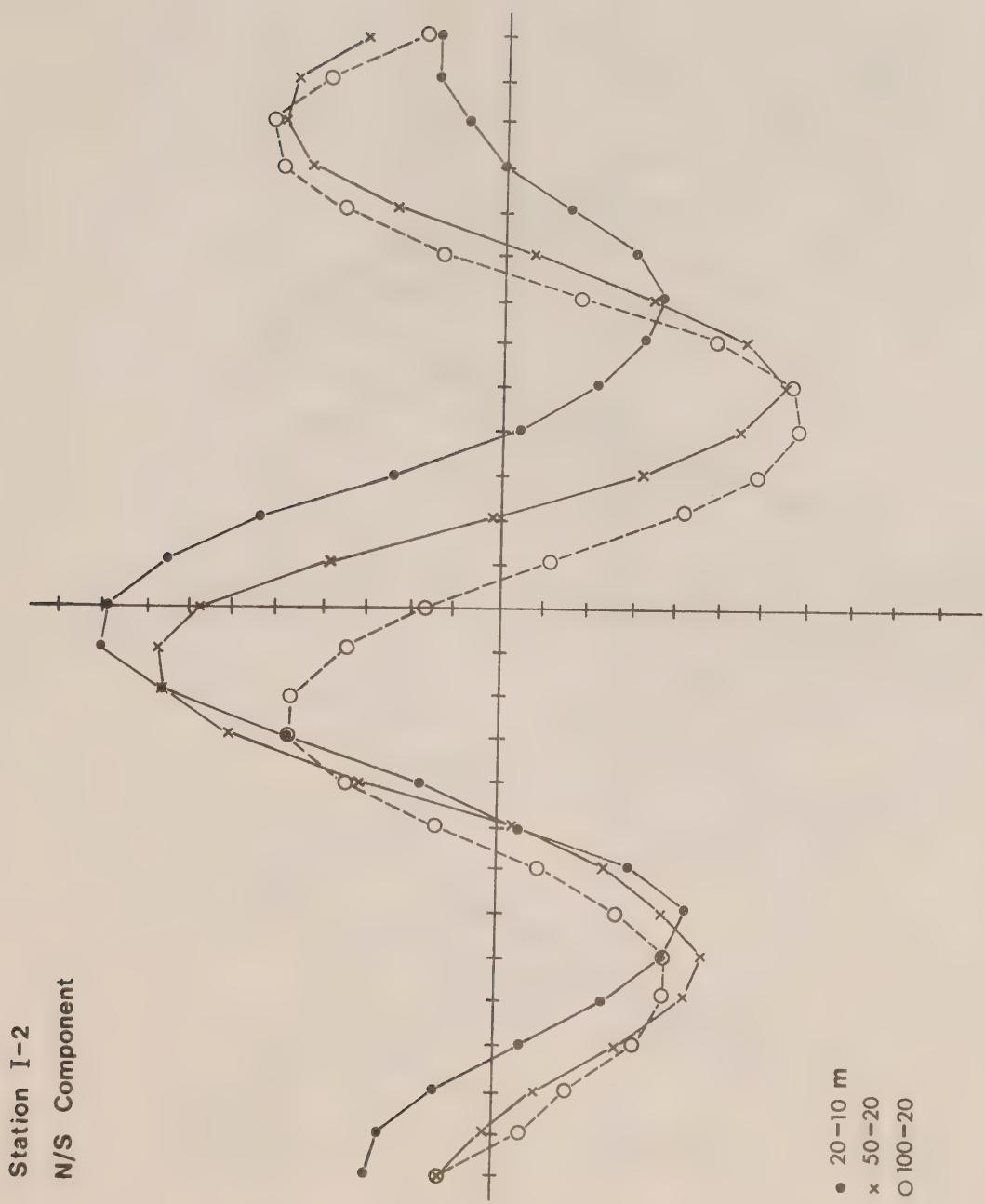
Station I-1
E/W Component

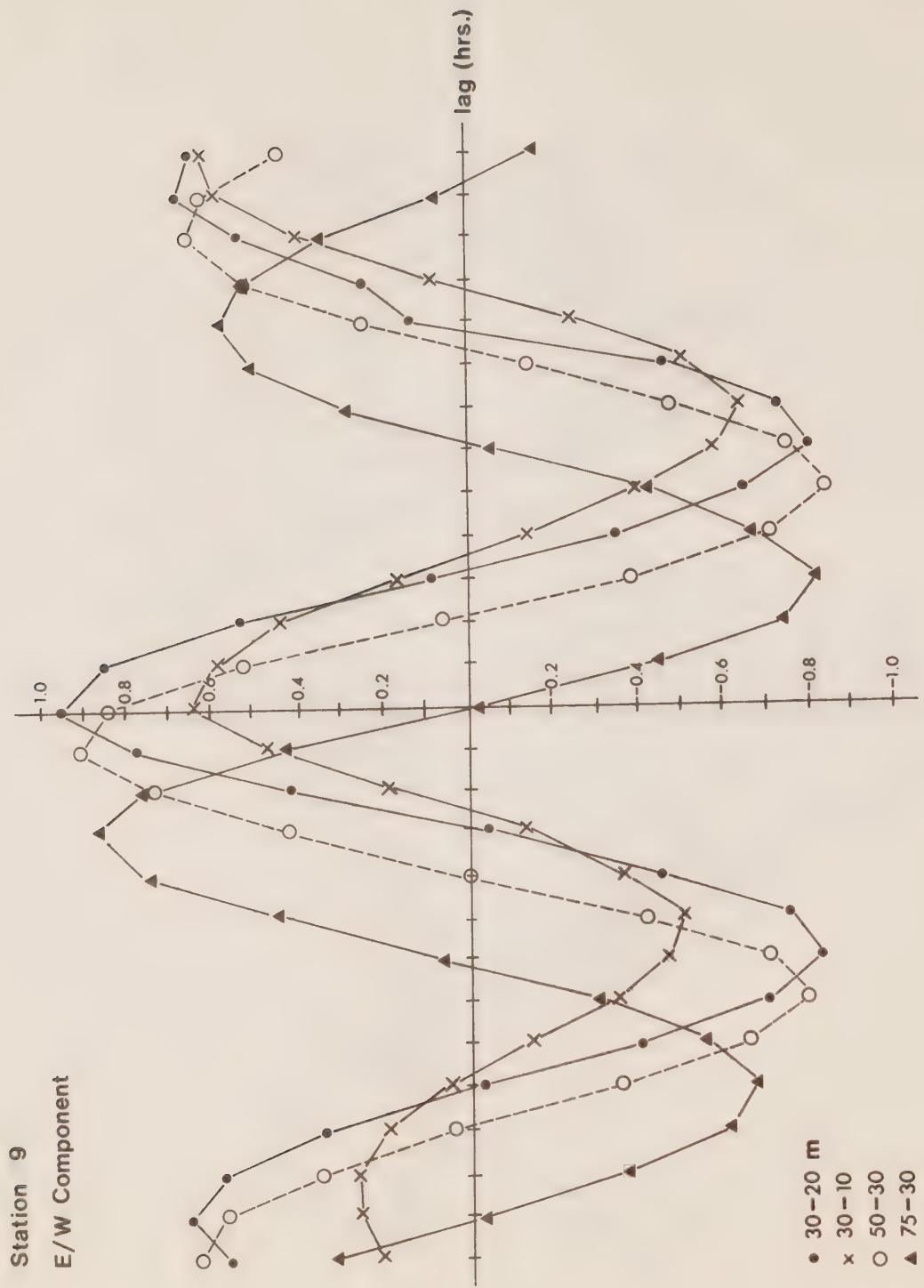




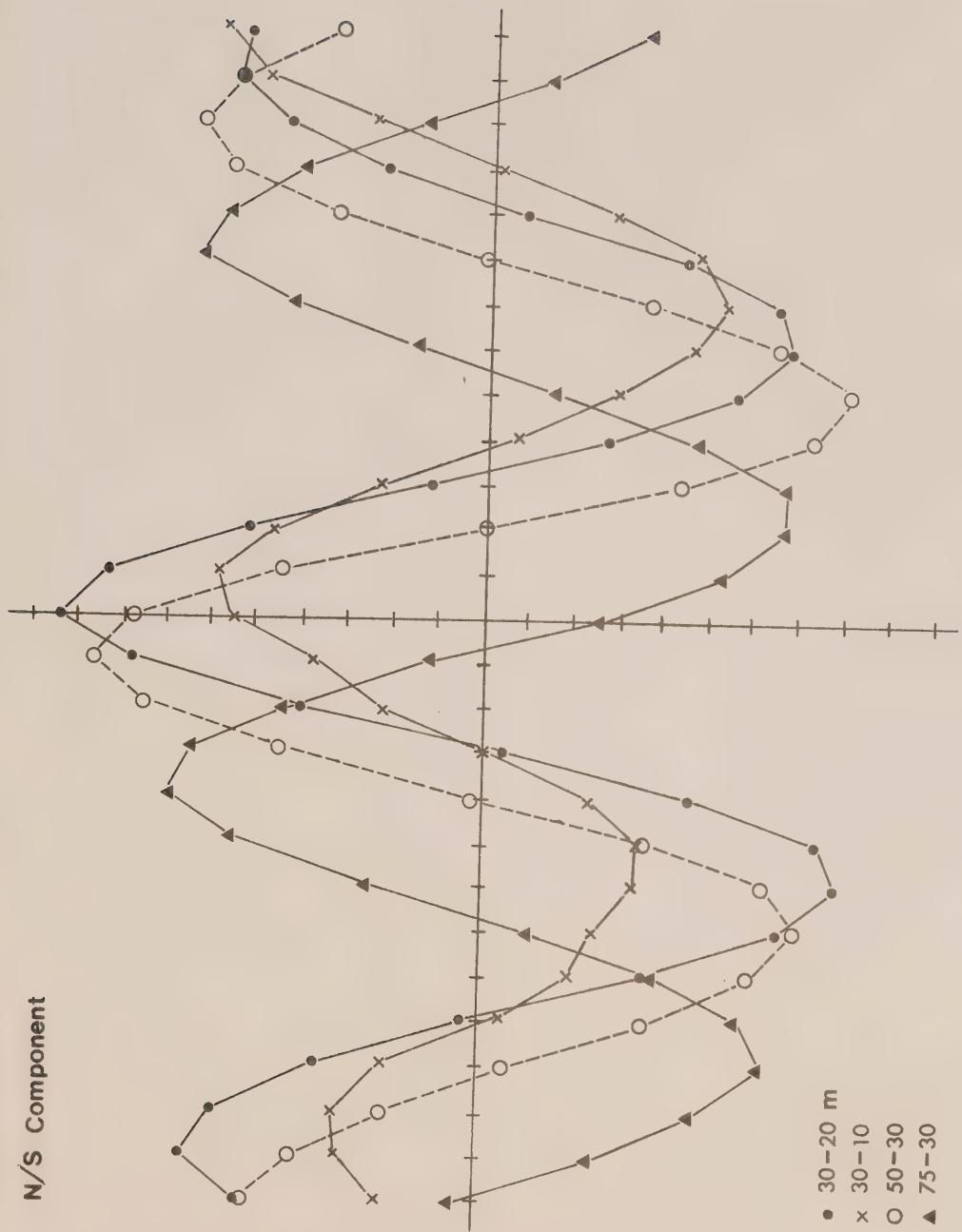
Station I-2
E/W Component







Station 9
N/S Component



Appendix D. Winds

Listed are vector-averaged wind, mean wind speed regardless of direction and average total variances (m^2/s^2).

D. Listings of wind properties. First two columns give magnitude and direction (counterclockwise from north) of vector averaged wind (direction toward which wind was blowing). Next column gives average wind speed regardless of direction. Last two columns give wind variances for each component. There were no winds at station T.

STATION	VECTOR SPEED (m/s)	MEAN DIR. ($^{\circ}$)	MEAN SPEED (m/s)	MEAN VARIANCE EAST-WEST (m/s) 2	MEAN VARIANCE NORTH-SOUTH (m/s) 2
44	11.9	9	19.9	58	470
43	29.2	-39	30.3	410	547
42	6.3	3	11.5	53	123
65	11.9	-7	12.9	38	213
I-3	7.8	-40	11.3	59	106
I-2	15.4	-178	19.3	107	312
I-1	16.3	-22	17.0	114	463
9	12.9	-2	16.3	101	338
14	5.1	120	6.1	30	24
5	6.2	-177	15.8	195	125
T	-	-	-	-	-



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**OCEANOGRAPHIC OBSERVATIONS
AT OCEAN STATION P**

5 January - 15 February 1979

VOLUME 97



**INSTITUTE OF OCEAN SCIENCES
Sidney, B.C.**

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5 January - 15 February 1979

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Sidney, B.C.

1981

ABSTRACT

Physical, chemical and biological oceanographic observations are made from the weathership at Ocean Weather Station Papa, and between Esquimalt and Station Papa, on a routine continuing basis. Physical oceanography data only are shown, including surface observations and profiles obtained with bottle casts and conductivity-temperature-pressure instruments.

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INTRODUCTION

Canadian operation of Ocean Weather Station P (Latitude 50°00'N, Longitude 145°00'W) was inaugurated in December 1950. The station is occupied primarily to make meteorological observations of the surface and upper air and to provide an air-sea rescue service. The station is manned by two vessels operated by the Marine Services Branch of the Ministry of Transport. They are the CCGS Vancouver and the CCGS Quadra. Each ship remains on station for a period of six weeks, and is then relieved by the alternate ship, thus maintaining a continuous watch.

Bathythermograph observations have been made at Station P since July 1952. A program of more extensive oceanographic observations commenced in August 1956. This was extended in April 1959 by the addition of a series of oceanographic stations along the route to and from Station P and Swiftsure Bank. These stations are known as Line P stations. The number of stations on Line P has been increased twice and now consists of twelve stations (Fig. 1). Bathythermograph observations and surface salinity sample collections, in addition to being made on Line P oceanographic stations, are also made at odd meridians at 40°, i.e. 139°40'W, 141°40'W, etc. These stations are known as Line P BT stations. Data observed prior to 1968 have been indexed by Collins et al (1969).

The present record includes STD and surface salinity and temperature data collected from the CCGS Vancouver during the period 5 January to 15 February 1979.

All physical oceanographic data have been stored by the Marine Environmental Data Services Branch (MEDS), Department of Fisheries and Oceans, 240 Sparks Street, 7th Floor West, Ottawa, Ontario, Canada, K1A 0E6. Requests for these data should be directed to MEDS.

Biological and productivity data are published in the Manuscript Report series of the Department of Fisheries and Oceans (DFO), Pacific Biological Station, Nanaimo, British Columbia, Canada. Requests for these data should be directed to DFO.

Marine geochemical data are for the Ocean Chemistry Division, Department of Fisheries and Oceans, Institute of Ocean Sciences, P.O. Box 6000, Sidney, B.C., Canada, V8L 4B2.

PROGRAM OF OBSERVATION FROM CCGS VANCOUVER, 5 JANUARY - 15 FEBRUARY 1979 (P-79-1)
(MEDS Ref. No. 15-79-001)

Oceanographic observations were made by the officers and crew of the CCGS Vancouver.

En Route to Station P (Line P)

STD profiles were taken at Line P stations 1 to 12.

Surface salinity and nutrient samples were taken from the seawater loop or bucket.

The surface temperature recorder (engine intake) and thermosalinograph (seawater loop) were run continuously.

Mechanical BT's or XBT's were taken at all BT positions.

On Station P

The oceanographic program was carried out as follows:

Physical Oceanography

- 1) Thirty-eight STD profiles were taken at Station P.
Eighteen STD profiles were taken at MILE GRID positions.
- 2) Daily salinity samples were taken from the seawater loop.
- 3) BT's or XBT's were taken every three hours to coincide with meteorological observations, encoded and transmitted according to the IGOSS format.

Marine Geochemistry

Samples for air CO₂, PCO₂, POC, alkalinity, nutrients and tritium obtained during this cruise are for the Ocean Chemistry Division and are not included in this Data report.

Biological Oceanography

Samples from 150 metre vertical plankton hauls (Station P) and nutrients (Line P) obtained during this cruise are for the Pacific Biological Station and are not included in this Data report.

En Route from Station P (Line P)

STD profiles were taken at Line P stations 12 to 8 and 5 to 1.

Surface salinity and nutrient samples were taken from the seawater loop or bucket.

The surface temperature recorder (engine intake) and thermosalinograph (seawater loop) were run continuously.

Mechanical BT's or XBT's were taken at all BT positions.

Observations for Other Agencies

- 1) Marine mammal observations were made by the ship's officers for Mr. M. Bigg, Department of Fisheries and Oceans, Pacific Biological Station, Nanaimo, B.C., Canada.
- 2) Bird observations were made by the ship's officers for Dr. M. Myres, University of Alberta, Calgary, Alberta, Canada and Mr. J. Guiget, Curator of Birds and Mammals, Provincial Museum, Department of Provincial Secretary and Travel Industry, Victoria, British Columbia, Canada.

OBSERVATIONAL PROCEDURES

The daily surface water temperatures were measured from a bucket sample using a deck thermometer of $\pm 0.1^{\circ}\text{C}$ accuracy. The daily surface salinity samples were obtained from the seawater loop. When the seawater loop was not operational these samples were obtained with a bucket, and are indicated with a '*' in this data record.

Salinity determinations were made ashore with a Guildline Autosal salinometer. Accuracy using duplicated determinations is estimated to be $\pm 0.003^{\circ}/\text{oo}$.

Line P engine intake continuous temperature on both ships was recorded by a Honeywell Electronik 15 Recorder. The temperature probe is at a depth of approximately 3 metres below the sea surface and the instrument accuracy is believed to be $\pm 0.1^{\circ}\text{C}$.

Each ship is equipped with a Plessey Model 6600-T thermosalinograph which is used, on Line P, for continuous recording of surface temperatures and salinities from the ship's seawater loop. The temperature probe is mounted at the seawater loop intake (approximately 3 metres below the surface) and the salinity probe and recorder are situated in the dry lab. The accuracy of this instrument is believed to be $\pm 0.1^{\circ}\text{C}$ for temperature and $\pm 0.1^{\circ}/\text{oo}$ for salinity.

STD profiles were taken with a Guildline Model 8700 STD system.

COMPUTATIONS

Analog traces from the salinity-temperature-pressure instrument have been digitized using a Hewlett-Packard (HP) 9821A calculator and an HP 9864A digitizer, then replotted by an HP 9862A plotter. Digitization was continued until original and computer plotted traces were coincident.

The HP 9821A was then connected to an HP 2116 minicomputer and the digitized data transferred to 9-track tape. Using a UNIVAC 1106 computer the data was listed and obvious spikes removed.

Generally a correction is applied, determined by comparison with hydrographic casts of the same cruise. As no hydrographic casts were taken, the STD data were compared with hydrographic casts from the previous and following cruises.

The differences were very irregular, therefore because of difficulty in calibrating no correction has been applied.

Temperature and salinity values were listed at standard pressures and plotted using a Houston Complot DP8S Plotter.

Data values which we suspect but which we have included in this data record are indicated with a plus. These data have been removed from magnetic tape records.

The headings for the data listings are explained as follows:

PRESS	is pressure (decibars)
TEMP	is temperature (degrees Celsius)
SAL	is salinity (parts per thousand)
DEPTH	is reported in metres
SIGMA-T	is specific gravity anomaly
SVA	is specific volume anomaly
THETA	is potential temperature (degrees Celsius)
SVA (THETA)	is potential specific volume anomaly
DELTA D	is geopotential anomaly (J/Kg)
POT EN	is potential energy in units of 10^8 ergs/cm ²
SOUND	is the velocity of sound in metres per second

Data were processed for publication by Messrs. C. de Jong, B. Minkley and J. Linguanti.

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LOG OF HYDROGRAPHIC AND STD OBSERVATIONS

Consec #	Stations	Date (Z)	Time (Z)	STD (m)	Hydrocast (m)	Comments
001	1	05/01/79	2325	120		Line 'P'
002	2	06/01/79	0056	97		
003	3	06/01/79	0254	1200		
004	4	06/01/79	0614	1350		
005	5	06/01/79	0955	1400		
006	6	06/01/79	1540	1400		
007	7	06/01/79	2145	1400		
008	8	07/01/79	0353	1300		
009	9	07/01/79	0942	1275		
010	10	07/01/79	1535	1300		
011	11	07/01/79	2225	1400		
012	12	08/01/79	0545	1400		
013	P	08/01/79	1728	1400		
014	P	08/01/79	1745	300		
015	W3	08/01/79	1954	300		MILE grid
016	W4	08/01/79	2155	300		
017	C1	09/01/79	0135	300		
018	P	09/01/79	1735	1400		
019	P	10/01/79	1542	1400		
020	P	10/01/79	1603	300		MILE grid
021	W3	10/01/79	1807	300		
022	W4	10/01/79	2025	300		
023	C1	10/01/79	2230	300		
024	E4	11/01/79	0135	300		
025	E3	11/01/79	0327	300		
026	P	11/01/79	1715	1200		
027	P	12/01/79	1725	1400		
028	P	13/01/79	1715	1400		
029	P	14/01/79	1720	1400		
030	P	15/01/79	1720	1400		
031	P	16/01/79	1735	1400		
032	P	18/01/79	1740	1400		
033	P	19/01/79	1715	1400		
034	P	20/01/79	1710	1400		
035	P	21/01/79	2145	1400		
036	P	22/01/79	1720	1400		
037	P	23/01/79	2150	1400		
038	P	24/01/79	1715	1325		
039	P	24/01/79	1740	300		MILE grid
040	E3	24/01/79	1927	300		
041	E4	24/01/79	2145	300		
042	C1	25/01/79	0015	300		
043	W4	25/01/79	0250	300		
044	W3	25/01/79	0435	300		
045	P	25/01/79	1720	1400		
046	P	26/01/79	1725	1400		
047	P	27/01/79	1715	1400		
048	P	28/01/79	1710	1400		
049	P	29/01/79	1720	1400		
050	P	30/01/79	1720	1400		

LOG OF STD AND HYDROGRAPHIC OBSERVATIONS (continued)

Consec #	Stations	Date (Z)	Time (Z)	STD (m)	Hydrocast (m)	Comments
051	P	31/01/79	1720	1400		
052	P	01/02/79	1720	1400		
053	P	02/02/79	1715	1400		
054	P	03/02/79	1725	1400		
055	P	04/02/79	2315	1400		
056	P	05/02/79	1725	1400		
057	P	06/02/79	2320	1345		
058	P	07/02/79	1715	1400		
059	P	07/02/79	1740	300		
060	E3	07/02/79	1930	300		
061	E4	07/02/79	2110	300		
062	C1	07/02/79	2340	300		
063	W4	08/02/79	0220	300		
064	W3	08/02/79	0430	300		
065	P	08/02/79	1720	1400		
066	P	09/02/79	1715	1400		
067	P	10/02/79	1720	1400		
068	P	11/02/79	1725	1400		
069	12	12/02/79	0110	1400		
070	11	12/02/79	0830	1400		
071	10	12/02/79	1510	1400		
072	9	12/02/79	2130	1400		
073	8	13/02/79	0408	1350		
074	5	13/02/79	2325	1400		
075	4	14/02/79	0312	1400		
076	3	14/02/79	0700	1400		
077	2	14/02/79	0935	100		
078	1	14/02/79	1126	100		

MILE grid

Line 'P'

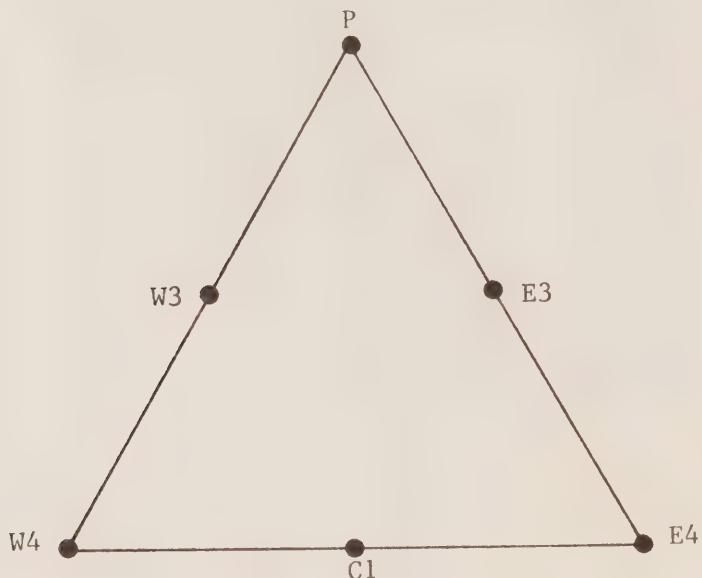
MILE GRID

(MIXED LAYER EXPERIMENT)

During the MILE experiment in the summer of 1977 a 20-mile triangular grid was initiated with STD stations to 300 metres.

During this cruise the grid survey was completed three times.

1st - STD consec. #014 - #017 (incomplete)
 2nd - STD consec. #020 - #025
 3rd - STD consec. #039 - #044
 4th - STD consec. #059 - #064



Station ID and positions are as follows:

P = $50^{\circ}00'N$, $145^{\circ}00'W$
 E3 = $49^{\circ}52'N$, $144^{\circ}52'W$
 E4 = $49^{\circ}43'N$, $144^{\circ}44'W$
 C1 = $49^{\circ}42'N$, $145^{\circ}00'W$
 W4 = $49^{\circ}43'N$, $145^{\circ}15'W$
 W3 = $49^{\circ}52'N$, $145^{\circ}07'W$

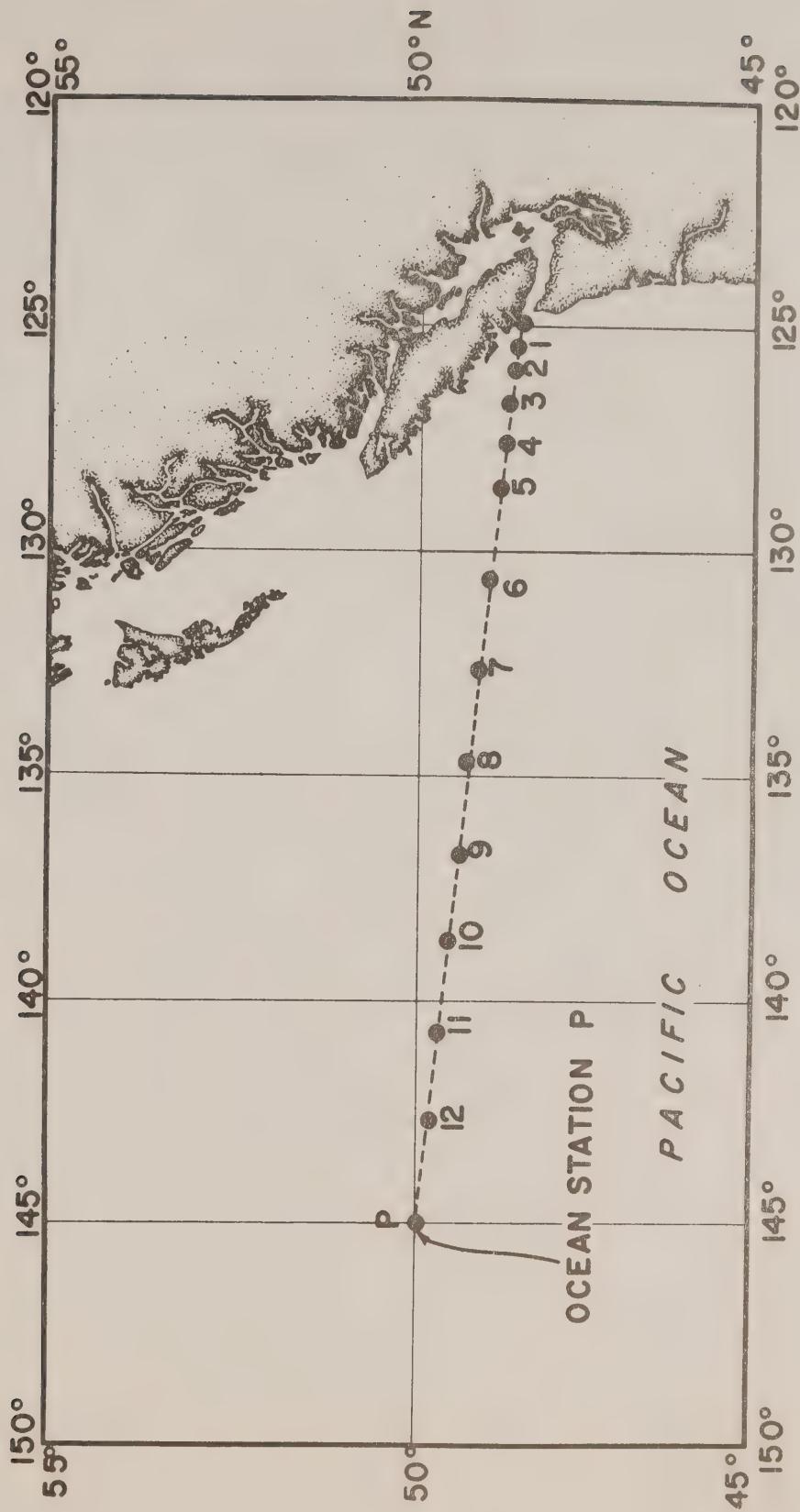


Fig. 1 Chart showing Line P station positions.

Oceanographic Data Obtained on Cruise P-79-1

(MEDS Reference No. 15-79-001)

Results of STD Observations

(P-79-1)

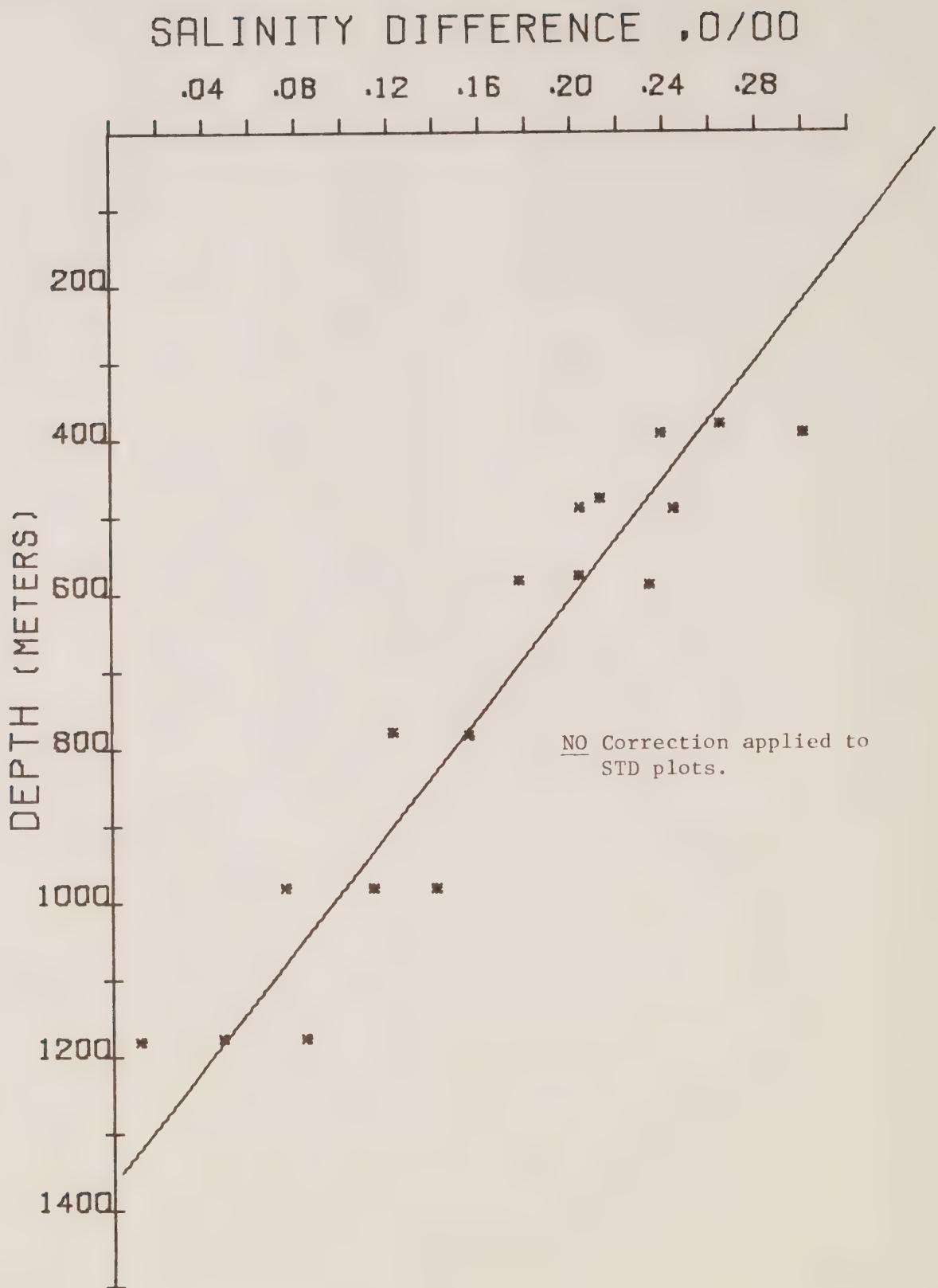


Figure 2. Salinity difference between hydro data and STD.
P-79-1

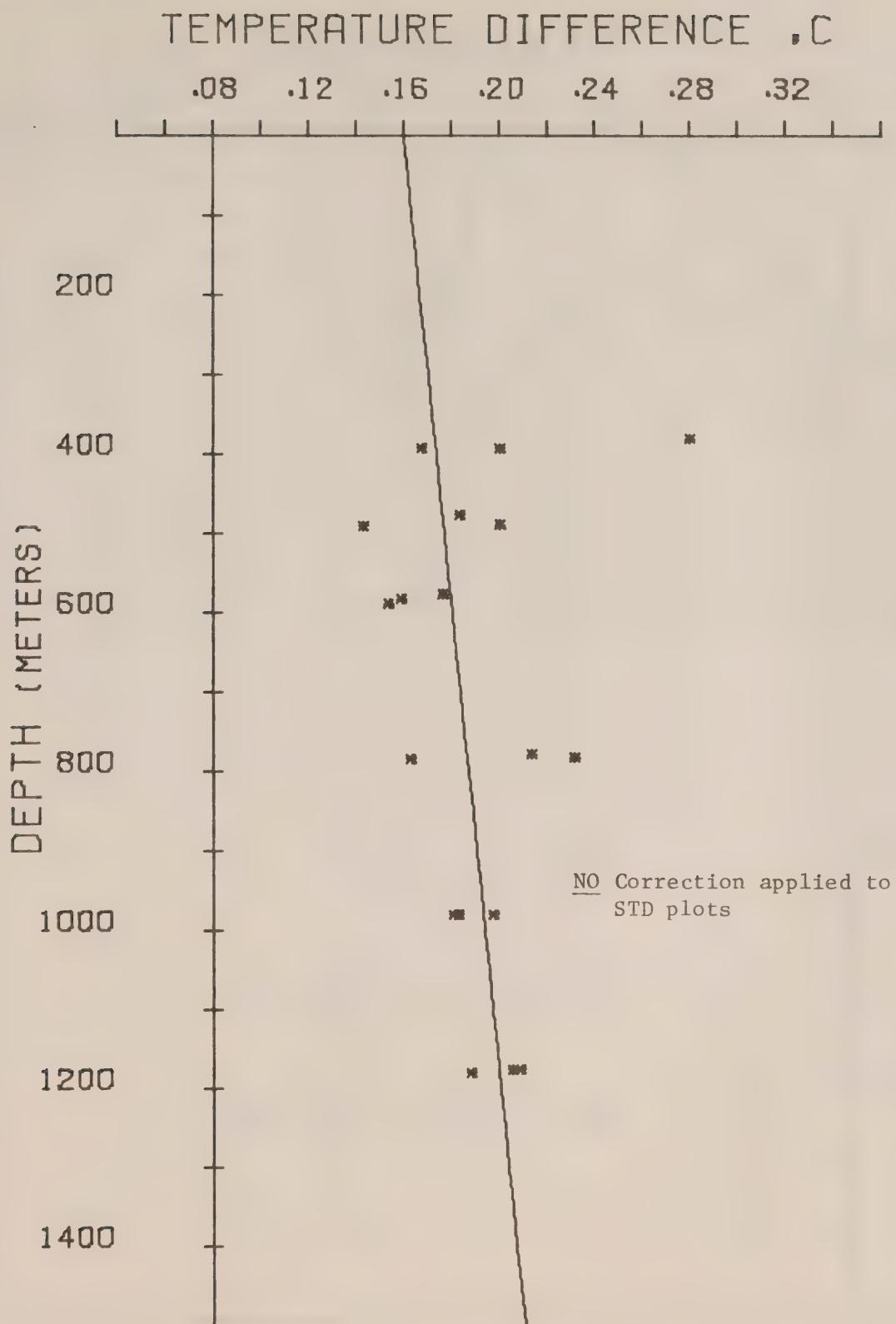
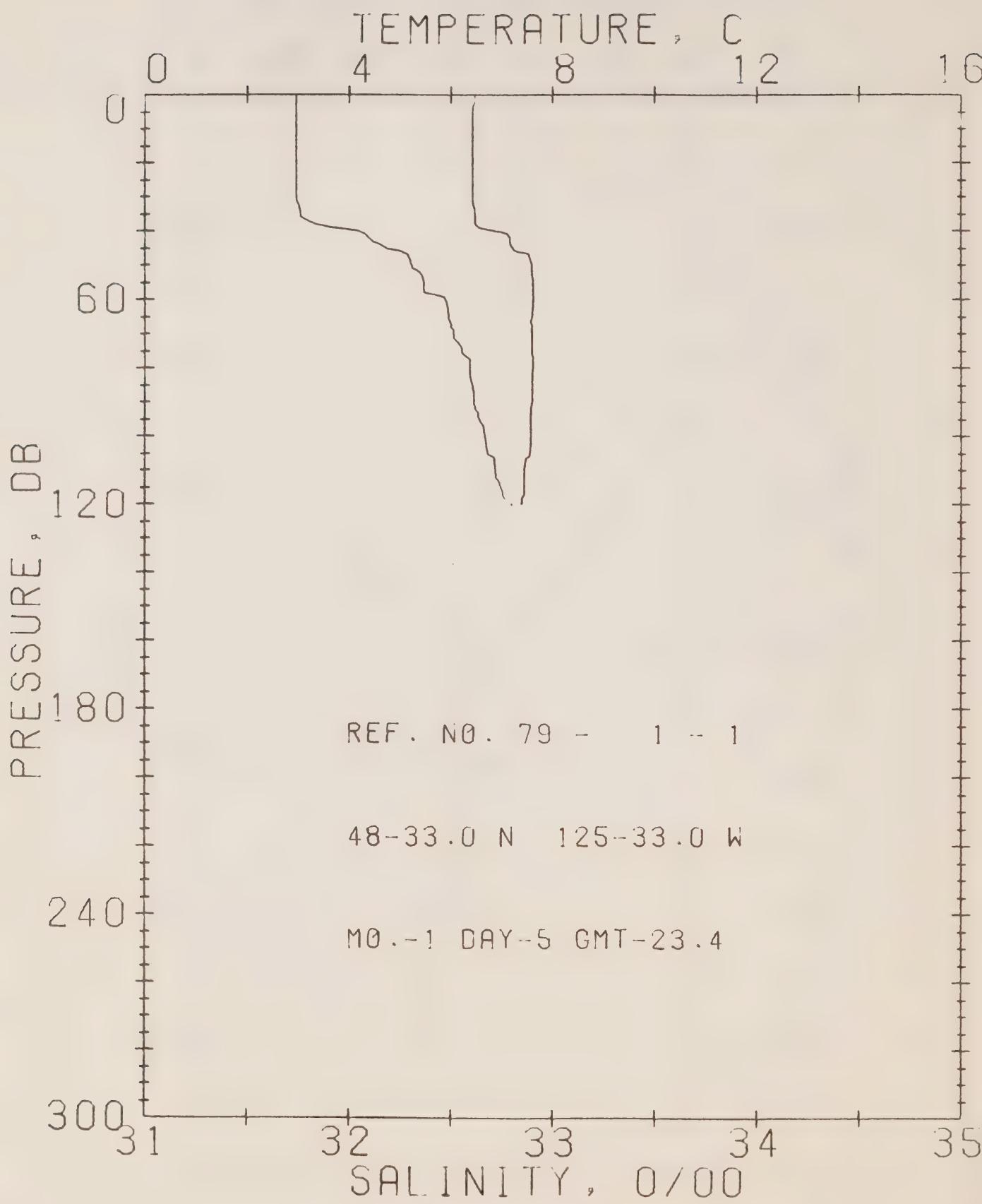


Figure 3. Temperature difference between hydro data and STD. P-79-1



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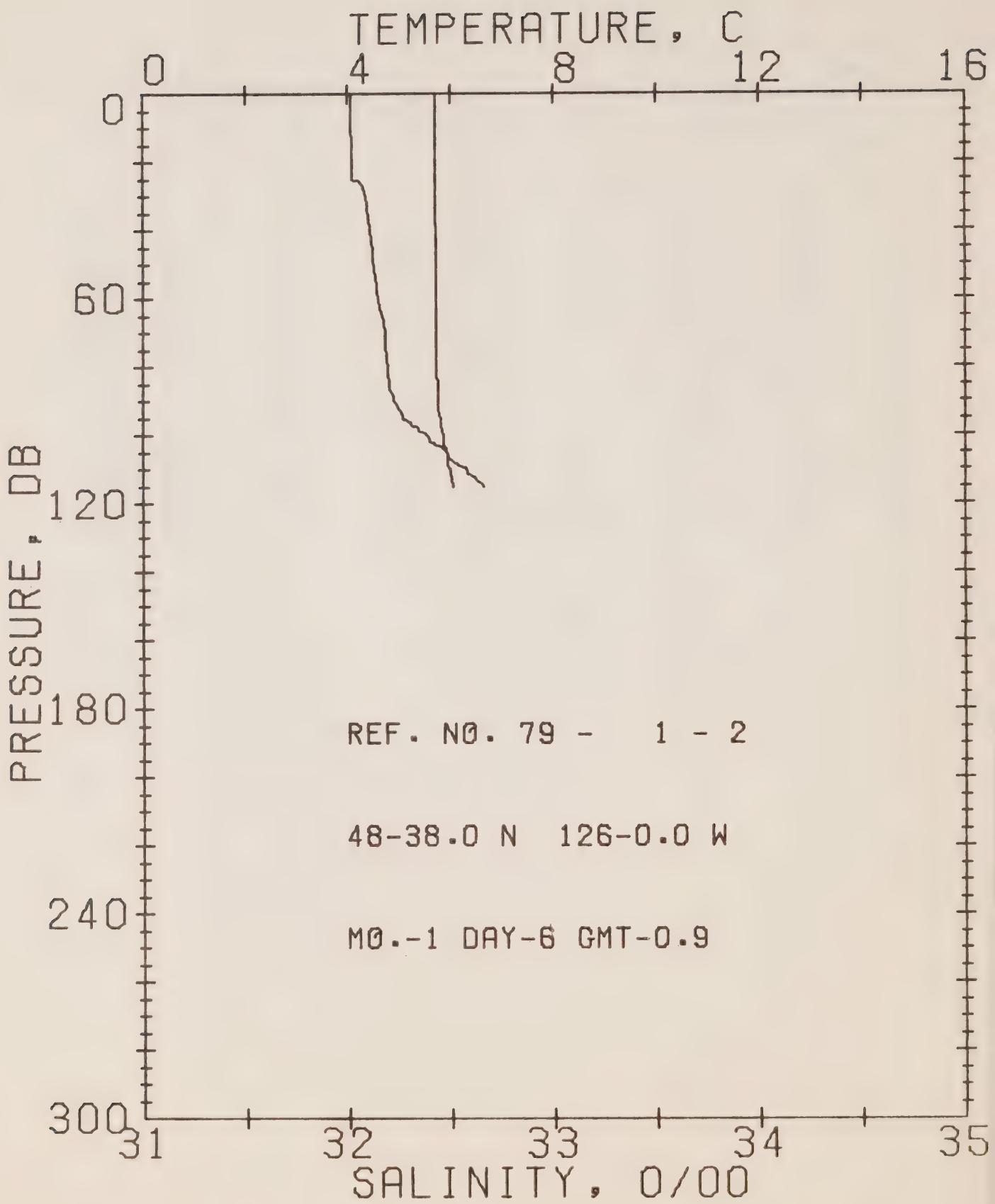
REFERENCE NO. 79-1-1 DATE 5/ 1/79

POSITION 48-33.0N, 125-33.6W GWT 23.4 STATION 1

RESULTS OF STP CAST 74 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.47	31.74	0	24.95	301.6	.00	.00	1473.
10	6.44	31.74	10	24.95	301.4	.30	.02	1473.
20	6.43	31.74	20	24.95	301.4	.60	.06	1473.
30	6.44	31.74	30	24.95	301.6	.90	.14	1473.
40	6.86	32.04	40	25.13	284.5	1.20	.24	1475.
50	7.59	32.31	50	25.25	273.9	1.48	.37	1479.
60	7.62	32.47	60	25.37	262.2	1.75	.52	1479.
70	7.60	32.51	70	25.40	259.5	2.01	.70	1479.
80	7.62	32.59	80	25.46	253.9	2.27	.89	1480.
90	7.60	32.61	90	25.48	252.3	2.52	1.11	1480.
100	7.56	32.67	99	25.53	247.8	2.77	1.35	1480.
110	7.45	32.72	109	25.59	242.4	3.02	1.62	1480.
120	7.39	32.80	119	25.66	235.8	3.26	1.90	1480.



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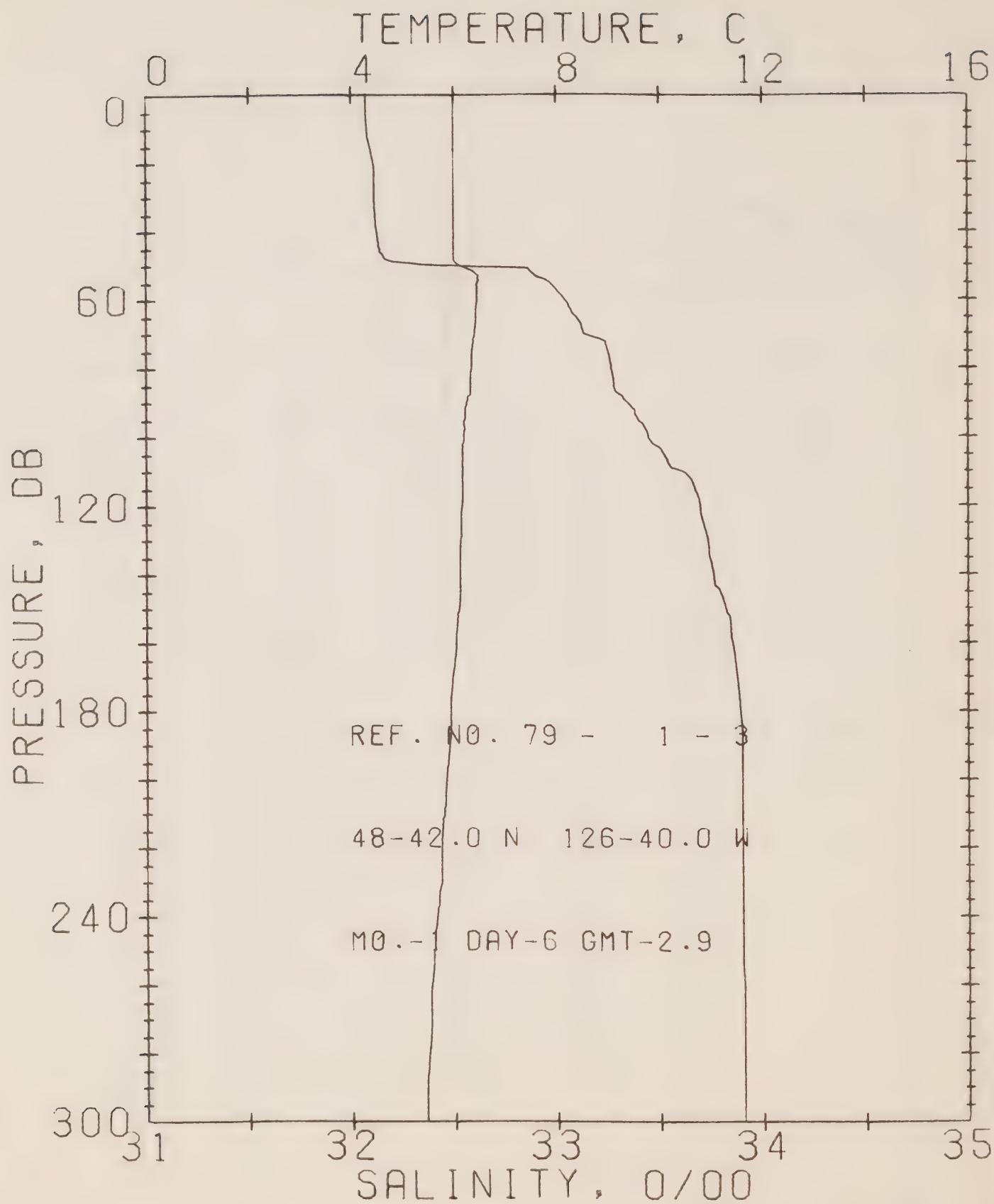
REFERENCE NO. 79- 1- 2 DATE 6/ 1/79

POSITION 48-38.0N, 126- 0W GMT .9 STATION 2

RESULTS OF STP CAST 43 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA	SVA	DELTA	POT.	SOUND
				T		D	EN	
0	5.70	32.01	0	25.25	272.5	.00	.00	1470.
10	5.70	32.01	10	25.25	272.5	.27	.01	1470.
20	5.71	32.02	20	25.26	272.1	.54	.06	1470.
30	5.71	32.06	30	25.31	267.5	.82	.12	1471.
40	5.72	32.10	40	25.33	266.1	1.08	.22	1471.
50	5.72	32.12	50	25.34	264.8	1.35	.34	1471.
60	5.72	32.14	60	25.36	263.3	1.61	.49	1471.
70	5.74	32.18	70	25.38	261.1	1.87	.66	1471.
80	5.74	32.19	80	25.39	260.4	2.13	.86	1472.
90	5.76	32.22	89	25.41	258.3	2.39	1.09	1472.
100	5.86	32.38	99	25.53	247.6	2.65	1.33	1473.
110	6.00	32.57	109	25.66	235.2	2.89	1.59	1474.

PRES	DEPTH	TEMP	SAL	PRES	DEPTH	TEMP	SAL
0.		5.70	32.01	81.		5.74	32.19
4.		5.70	32.01	86.		5.76	32.20
8.		5.70	32.01	87.		5.76	32.20
9.		5.70	32.01	89.		5.76	32.22
16.		5.71	32.02	90.		5.76	32.22
22.		5.71	32.02	92.		5.77	32.24
24.		5.71	32.02	94.		5.79	32.26
25.		5.71	32.02	95.		5.80	32.27
26.		5.71	32.06	97.		5.81	32.31
28.		5.71	32.07	99.		5.84	32.35
29.		5.71	32.08	100.		5.86	32.38
33.		5.71	32.09	102.		5.87	32.40
34.		5.71	32.09	103.		5.88	32.42
43.		5.72	32.11	104.		5.92	32.46
47.		5.72	32.12	106.		5.95	32.49
49.		5.72	32.12	107.		5.95	32.49
57.		5.72	32.14	109.		5.96	32.53
58.		5.72	32.14	110.		6.00	32.57
63.		5.73	32.15	111.		6.00	32.58
67.		5.73	32.17	113.		6.02	32.62
71.		5.74	32.18	115.		6.05	32.66
74.		5.74	32.18				



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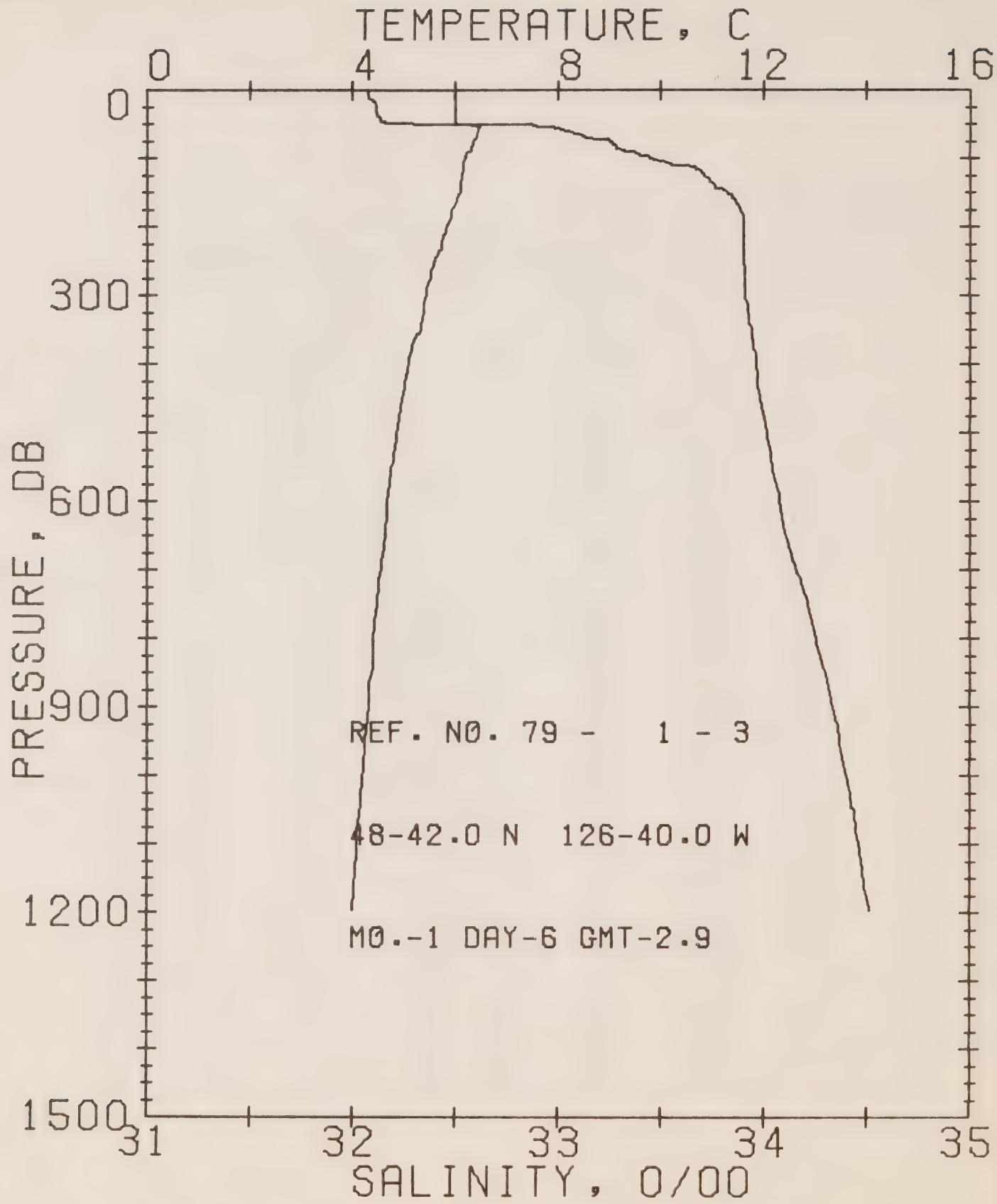
REFERENCE NO. 79- 1- 3 DATE 6/ 1/79

POSITION 48-42.0N, 126-40.0W GMT 2.9 STATION 3

RESULTS OF STP CAST 113 POINTS TAKEN FROM ANALOG TRACE

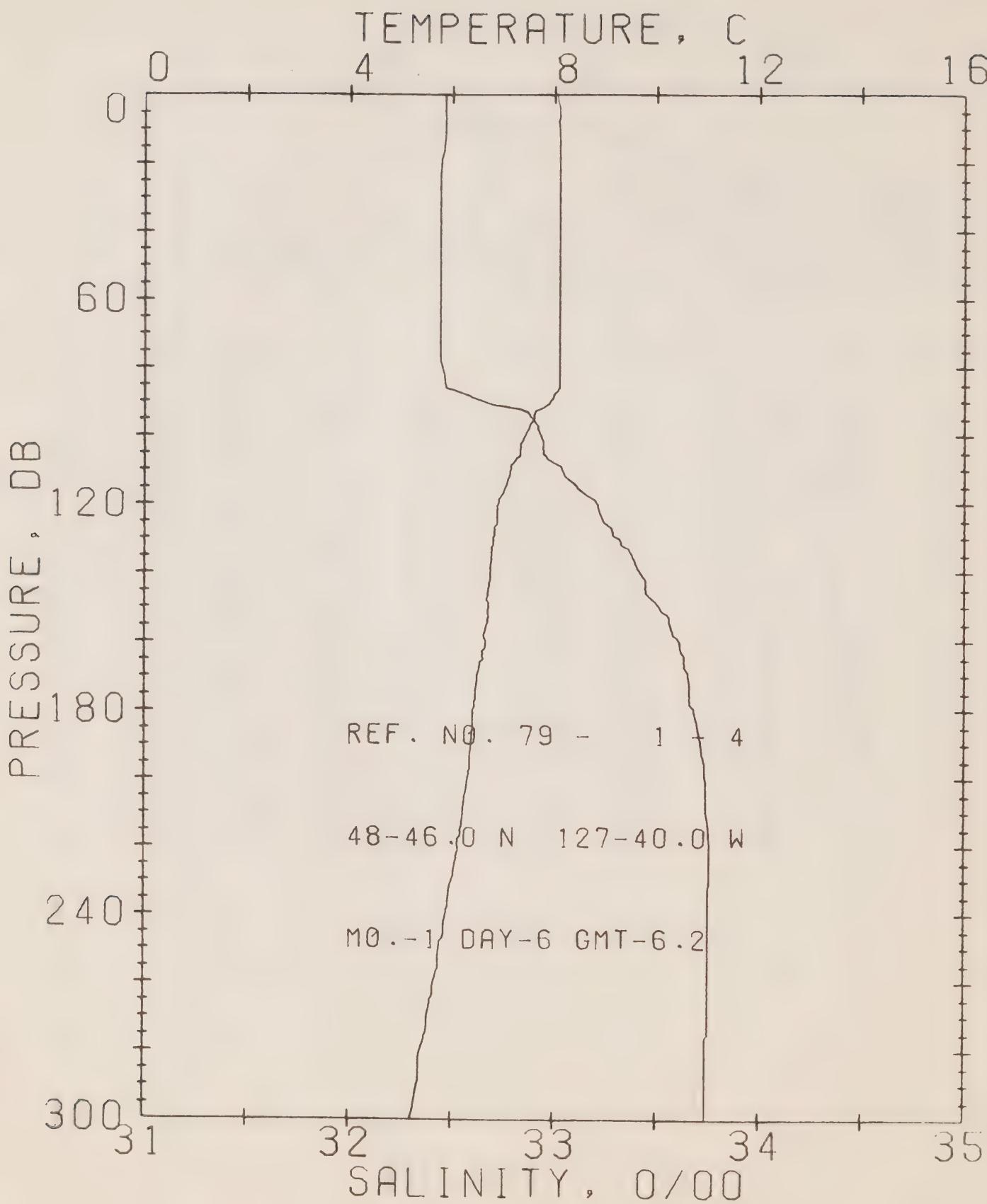
OUTLINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.99	32.07	0	25.27	271.3	.00	.00	1471.
10	6.00	32.06	10	25.27	270.9	.27	.01	1471.
20	5.99	32.11	20	25.30	268.7	.54	.06	1472.
30	6.00	32.11	30	25.30	268.7	.81	.12	1472.
40	6.00	32.12	40	25.31	267.8	1.08	.22	1472.
50	6.07	32.39	50	25.51	248.8	1.34	.34	1473.
60	6.45	33.04	60	25.97	205.0	1.56	.46	1475.
70	6.41	33.13	70	26.05	197.9	1.76	.59	1475.
80	6.35	33.27	80	26.17	186.8	1.95	.74	1475.
90	6.20	33.34	90	26.24	180.3	2.13	.90	1475.
100	6.20	33.45	99	26.35	171.8	2.31	1.07	1475.
110	6.16	33.62	109	26.47	158.8	2.47	1.25	1476.
120	6.14	33.69	119	26.53	153.1	2.63	1.43	1476.
130	6.13	33.73	129	26.56	150.2	2.78	1.62	1476.
140	6.10	33.76	139	26.59	147.8	2.93	1.83	1476.
150	6.08	33.82	149	26.64	143.0	3.07	2.04	1476.
160	6.02	33.86	159	26.67	140.2	3.22	2.26	1476.
170	5.97	33.88	169	26.64	138.0	3.35	2.50	1476.
180	5.92	33.89	179	26.71	136.4	3.49	2.74	1476.
190	5.90	33.90	189	26.72	135.7	3.63	3.00	1476.
200	5.84	33.90	199	26.73	135.1	3.76	3.27	1476.
210	5.79	33.90	209	26.73	134.6	3.90	3.55	1476.
220	5.72	33.90	218	26.74	133.9	4.03	3.84	1476.
230	5.72	33.90	228	26.74	134.0	4.17	4.15	1476.
240	5.65	33.90	238	26.75	133.3	4.30	4.47	1476.
250	5.59	33.90	248	26.76	132.7	4.43	4.80	1476.
260	5.54	33.91	258	26.77	131.5	4.57	5.15	1476.
270	5.51	33.91	268	26.77	131.2	4.70	5.50	1476.
280	5.48	33.91	278	26.78	130.9	4.83	5.87	1476.
290	5.43	33.91	288	26.78	130.5	4.96	6.25	1476.
300	5.43	33.91	298	26.78	130.6	5.09	6.64	1476.



OFFSHORE OCEANOGRAPHY GROUP
 REFERENCE NO. 79-1-3 DATE 6/ 1/79
 POSITION 48-42.0N, 126-49.0W GMT 2.9 STATION 3
 RESULTS OF STP CAST 192 POINTS TAKEN FROM ANALOG TRACE
 GUILDLINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.99	32.07	0	25.27	271.3	.00	.00	1471.
10	5.00	32.08	10	25.27	270.9	.27	.01	1471.
20	5.99	32.11	20	25.31	268.7	.54	.06	1472.
30	6.00	32.11	30	25.31	268.7	.81	.12	1472.
50	6.07	32.39	50	25.51	248.8	1.34	.34	1473.
75	6.35	33.25	75	26.15	138.3	1.85	.66	1475.
100	6.26	33.45	99	26.33	171.8	2.31	1.07	1475.
125	6.13	33.71	124	26.54	151.9	2.70	1.52	1476.
150	6.05	33.82	149	26.64	143.0	3.07	2.04	1476.
175	5.94	33.89	174	26.70	137.1	3.42	2.62	1476.
200	5.84	33.90	199	26.73	135.1	3.76	3.27	1476.
225	5.72	33.90	223	26.74	134.0	4.10	4.00	1476.
250	5.59	33.90	248	26.76	132.7	4.43	4.80	1476.
300	5.43	33.91	298	26.78	130.6	5.09	6.64	1476.
400	5.09	33.96	397	26.86	124.0	6.36	11.17	1477.
500	4.86	34.01	476	26.93	118.6	7.57	16.73	1477.
600	4.68	34.07	595	27.00	112.8	8.73	23.22	1478.
800	4.41	34.25	793	27.17	98.5	10.85	38.27	1481.
1000	4.20	34.40	991	27.31	86.2	12.68	55.08	1483.
1200	4.00	34.51	1178	27.42	77.7	14.32	73.37	1486.



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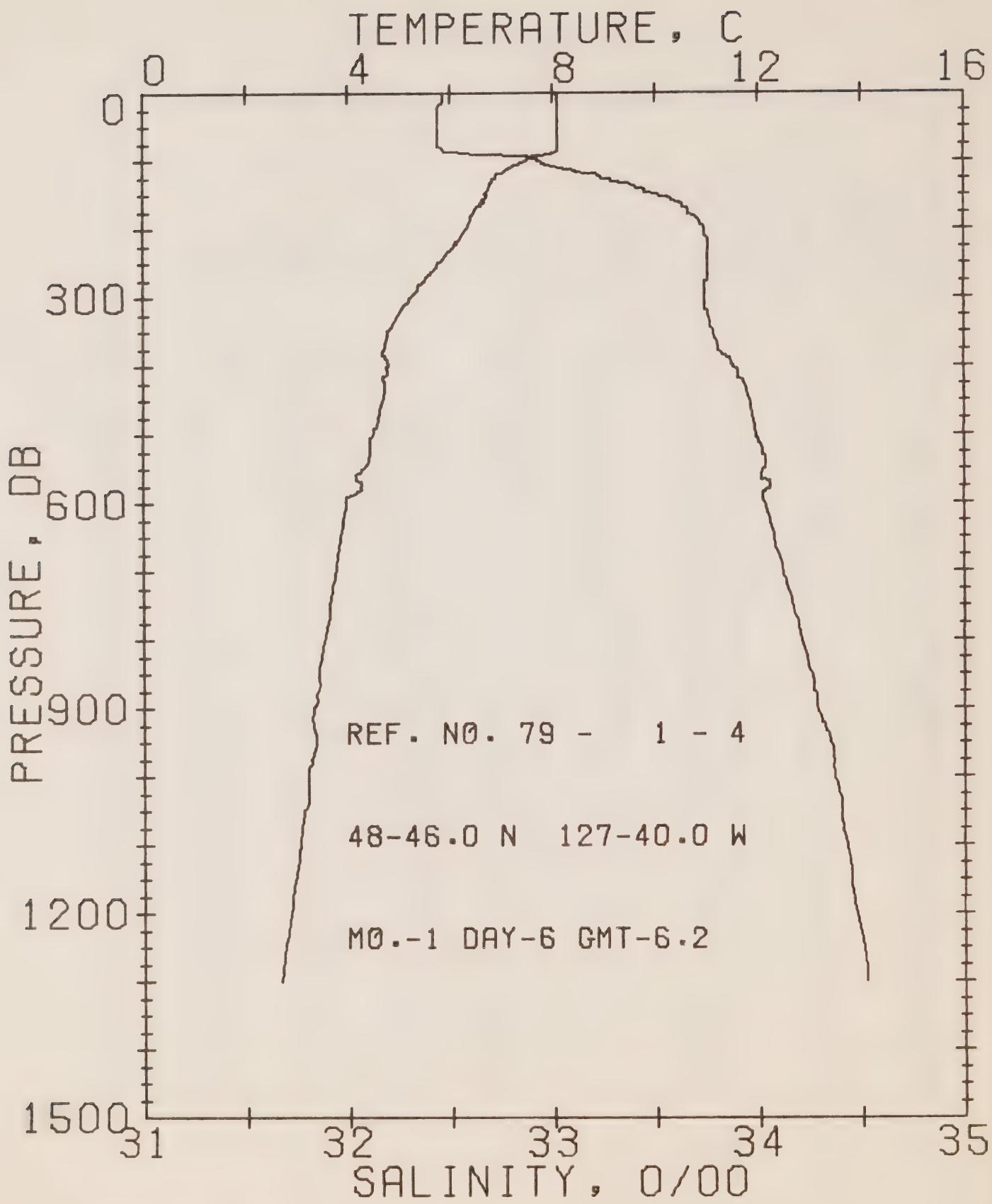
REFERENCE NO. 79-1-4 DATE 6/ 1/79

POSITION 48-46.0N, 127-40.0W GMT 6.2 STATION 4

RESULTS OF STP CAST 153 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.06	32.47	0	25.30	267.7	.00	.00	1480.
10	8.10	32.47	10	25.30	268.4	.27	.01	1480.
20	8.10	32.45	20	25.28	270.2	.54	.05	1480.
30	8.11	32.44	30	25.27	271.0	.81	.12	1480.
40	8.10	32.44	40	25.27	271.1	1.08	.22	1481.
50	8.10	32.44	50	25.26	271.2	1.35	.35	1481.
60	8.11	32.44	60	25.27	271.5	1.62	.50	1481.
70	8.10	32.44	70	25.27	271.6	1.89	.68	1481.
80	8.11	32.45	80	25.28	271.1	2.16	.88	1481.
90	7.93	32.64	90	25.46	254.2	2.43	1.12	1481.
100	7.43	32.94	99	25.76	225.6	2.67	1.34	1480.
110	7.14	33.04	109	25.86	214.5	2.89	1.58	1479.
120	6.92	33.21	119	26.04	199.1	3.09	1.82	1478.
130	6.81	33.32	129	26.15	189.6	3.29	2.07	1478.
140	6.76	33.42	139	26.23	181.6	3.48	2.33	1478.
150	6.72	33.51	149	26.31	174.6	3.65	2.59	1478.
160	6.66	33.61	159	26.39	166.5	3.82	2.86	1478.
170	6.49	33.65	169	26.45	161.4	3.99	3.13	1478.
180	6.41	33.68	179	26.48	158.3	4.15	3.42	1478.
190	6.37	33.71	189	26.51	155.5	4.30	3.72	1478.
200	6.31	33.73	199	26.54	153.3	4.46	4.02	1478.
210	6.20	33.74	209	26.56	151.5	4.61	4.34	1478.
220	6.12	33.76	219	26.58	149.3	4.76	4.67	1478.
230	6.00	33.76	228	26.60	147.9	4.91	5.01	1477.
240	5.88	33.75	238	26.60	147.3	5.06	5.37	1477.
250	5.75	33.75	248	26.62	145.9	5.20	5.73	1477.
260	5.65	33.75	258	26.63	144.7	5.35	6.11	1476.
270	5.53	33.75	268	26.65	143.4	5.49	6.50	1476.
280	5.39	33.74	278	26.65	142.6	5.64	6.90	1475.
290	5.33	33.74	288	26.66	142.0	5.78	7.31	1475.
300	5.20	33.74	298	26.68	140.5	5.92	7.74	1475.



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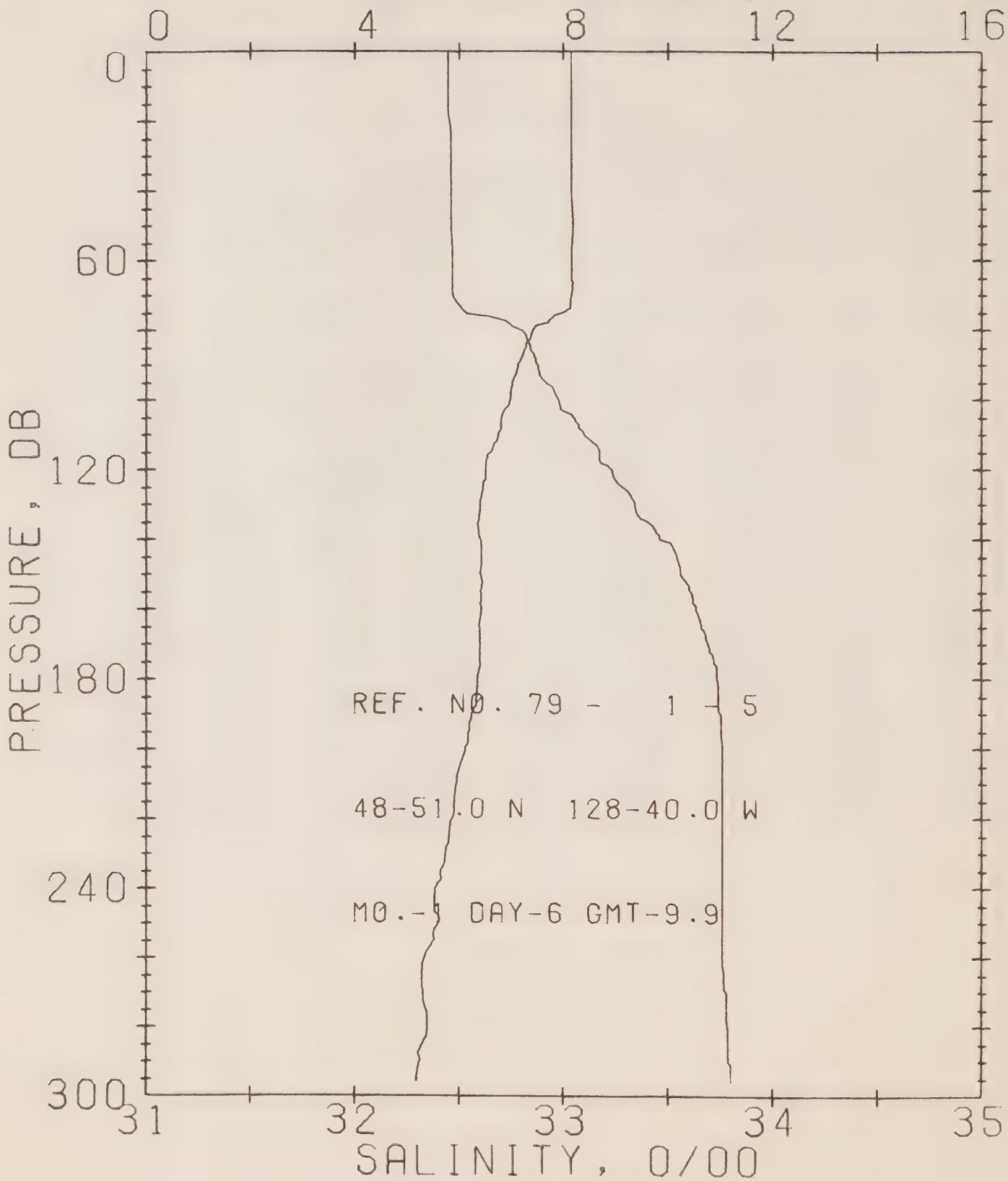
REFERENCE NO. 79- 1- 4 DATE 6/ 1/79

POSITION 48-46.0N, 127-40.0W GMT 6.2 STATION 4

RESULTS OF STP CAST 324 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.06	32.47	0	25.30	267.7	.00	.00	1480.
10	8.10	32.47	10	25.30	268.4	.27	.01	1480.
20	8.10	32.45	20	25.28	270.2	.54	.05	1480.
30	8.11	32.44	30	25.27	271.0	.81	.12	1480.
50	8.10	32.44	50	25.28	271.2	1.35	.35	1481.
75	8.11	32.44	75	25.27	271.8	2.03	.78	1481.
100	7.43	32.94	99	25.76	225.6	2.67	1.34	1480.
125	6.87	33.24	124	26.07	196.2	3.19	1.95	1478.
150	6.72	33.51	149	26.31	174.6	3.65	2.59	1478.
175	6.46	33.66	174	26.46	160.3	4.07	3.28	1478.
200	6.31	33.73	199	26.54	153.3	4.46	4.02	1478.
225	6.06	33.76	223	26.59	148.5	4.84	4.84	1477.
250	5.75	33.75	248	26.62	145.9	5.20	5.73	1477.
300	5.20	33.74	298	26.68	140.5	5.92	7.74	1475.
400	4.78	33.86	397	26.84	126.3	7.26	12.49	1475.
500	4.49	33.99	496	26.95	115.9	8.46	18.00	1476.
600	3.95	34.02	595	27.04	108.0	9.57	24.24	1475.
800	3.53	34.20	793	27.22	91.6	11.57	38.42	1477.
1000	3.20	34.37	991	27.39	77.1	13.24	53.73	1479.
1200	2.86	34.47	1188	27.56	67.0	14.68	69.79	1481.

TEMPERATURE, C



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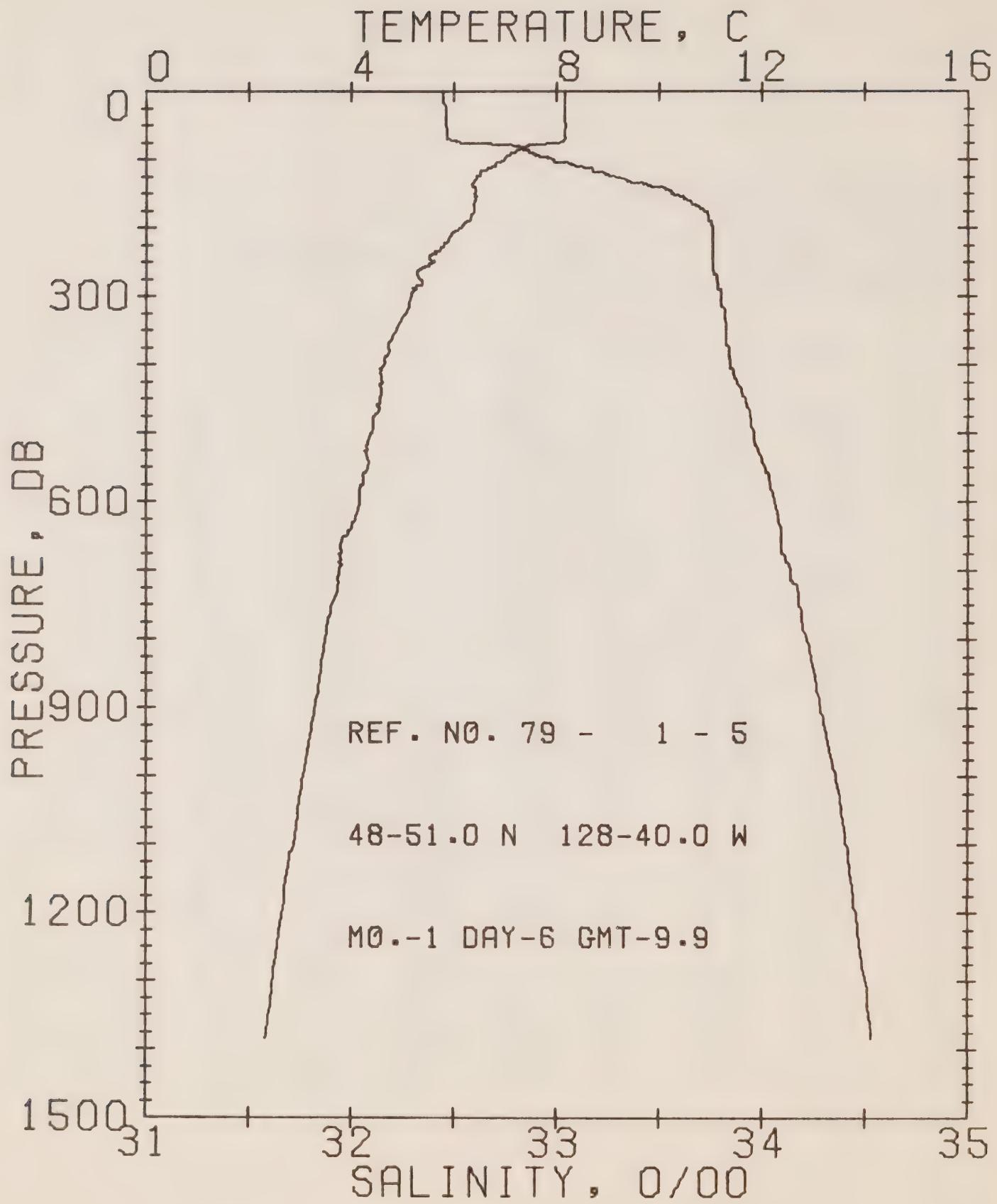
REFERENCE NO. 79-1-5 DATE 6/ 1/79

POSITION 48-51.0N, 128-40.0W GMT 9.9 STATION 5

RESULTS OF STP CAST 174 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.10	32.45	0	25.27	270.6	.00	.00	1480.
10	8.10	32.45	10	25.27	270.7	.27	.01	1480.
20	8.10	32.45	20	25.28	270.5	.54	.06	1481.
30	8.10	32.46	30	25.28	270.3	.81	.12	1481.
40	8.17	32.46	40	25.28	270.6	1.08	.22	1481.
50	8.18	32.46	50	25.28	270.9	1.35	.34	1481.
60	8.17	32.47	60	25.29	270.1	1.62	.50	1481.
70	8.17	32.47	70	25.29	270.3	1.89	.68	1481.
80	7.41	32.81	80	25.66	234.7	2.15	.87	1479.
90	7.13	32.88	89	25.76	226.0	2.38	1.07	1478.
100	6.98	32.98	99	25.86	216.7	2.60	1.29	1478.
110	6.76	33.10	109	25.96	205.0	2.81	1.51	1477.
120	6.51	33.23	119	26.11	192.3	3.01	1.74	1477.
130	6.40	33.34	129	26.22	182.7	3.20	1.98	1477.
140	6.40	33.46	139	26.31	174.1	3.38	2.23	1477.
150	6.41	33.56	149	26.39	166.9	3.55	2.48	1477.
160	6.44	33.63	159	26.44	162.2	3.71	2.74	1478.
170	6.41	33.69	169	26.49	157.5	3.87	3.00	1478.
180	6.35	33.73	179	26.53	153.6	4.02	3.28	1478.
190	6.24	33.75	189	26.56	151.1	4.18	3.57	1477.
200	6.11	33.76	199	26.58	148.9	4.33	3.87	1477.
210	5.94	33.76	209	26.60	146.9	4.48	4.18	1477.
220	5.86	33.76	218	26.61	146.0	4.62	4.50	1476.
230	5.73	33.76	228	26.63	144.6	4.77	4.83	1476.
240	5.55	33.76	238	26.65	142.5	4.91	5.18	1476.
250	5.59	33.76	248	26.65	143.1	5.05	5.53	1476.
260	5.33	33.76	258	26.68	140.1	5.20	5.90	1475.
270	5.30	33.76	268	26.70	138.4	5.33	6.28	1475.
280	5.39	33.79	278	26.69	139.1	5.47	6.67	1476.
290	5.25	33.79	289	26.71	137.3	5.61	7.07	1475.
300	5.16	33.80	298	26.73	135.6	5.75	7.47	1475.



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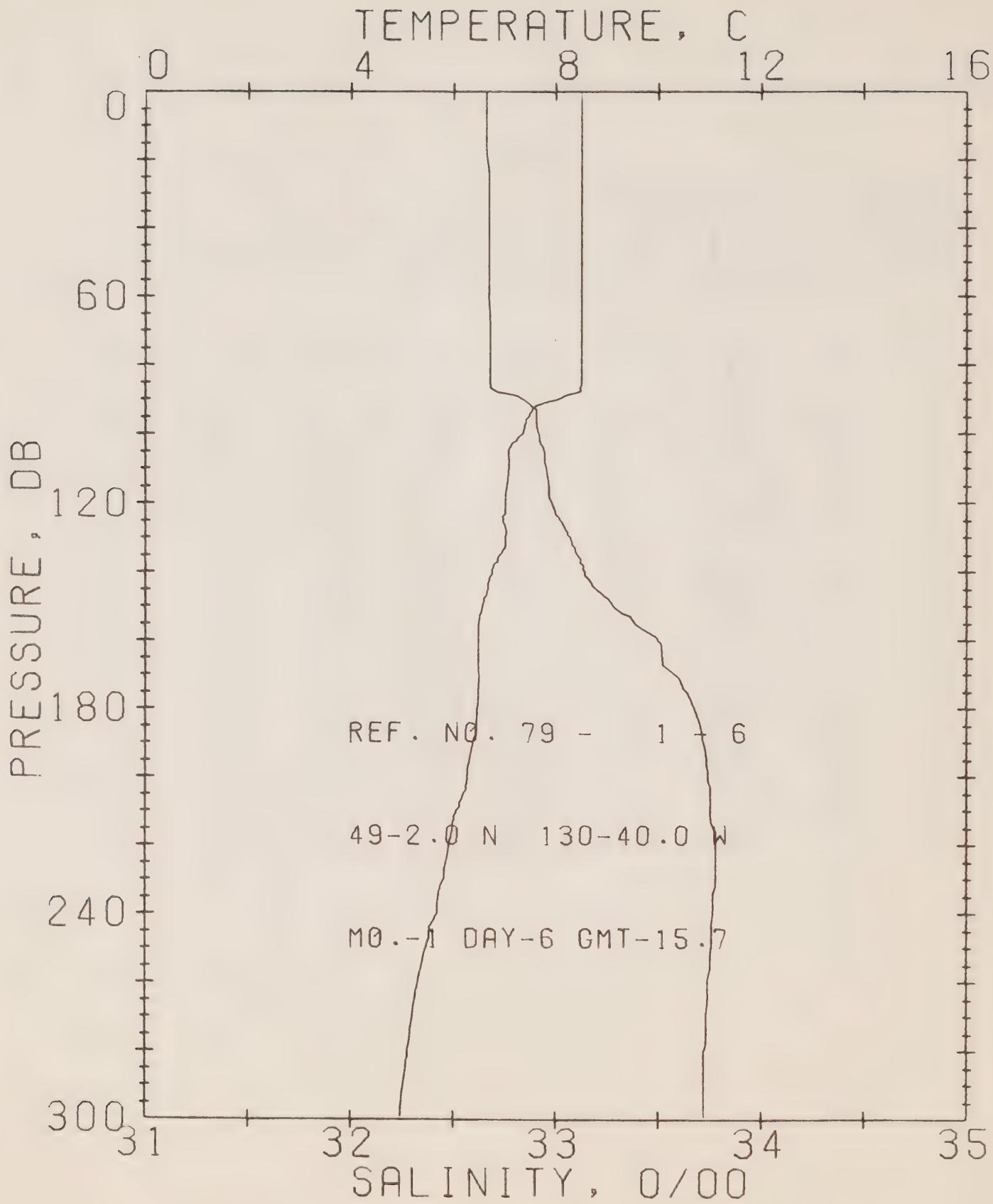
REFERENCE NO. 79-1-5 DATE 6/ 1/79

POSITION 48-51.0N, 128-40.0W GMT 9.9 STATION 5

RESULTS OF STP CAST 332 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.16	32.45	0	25.27	270.6	.00	.00	1480.
10	8.16	32.45	10	25.27	270.7	.27	.01	1480.
20	8.16	32.45	20	25.26	270.5	.54	.06	1481.
30	8.16	32.46	30	25.28	270.3	.81	.12	1481.
50	8.18	32.46	50	25.28	270.9	1.35	.34	1481.
75	7.98	32.53	75	25.36	263.3	2.03	.77	1481.
100	6.98	32.96	99	25.36	216.7	2.60	1.29	1478.
125	6.45	33.28	124	26.16	187.6	3.11	1.86	1477.
150	6.41	33.56	149	26.39	166.9	3.55	2.48	1477.
175	6.41	33.72	174	26.51	155.3	3.95	3.14	1478.
200	6.11	33.76	199	26.58	148.9	4.33	3.87	1477.
225	5.80	33.76	223	26.62	145.4	4.69	4.66	1476.
250	5.59	33.76	248	26.65	143.1	5.05	5.53	1476.
300	5.16	33.80	298	26.73	135.6	5.75	7.47	1475.
400	4.62	33.85	397	26.83	126.7	7.06	12.14	1474.
500	4.37	33.96	496	26.94	116.6	8.27	17.71	1475.
600	4.15	34.06	595	27.05	107.6	9.40	23.99	1476.
600	3.49	34.22	793	27.24	90.2	11.37	38.01	1477.
1000	3.06	34.36	991	27.39	76.2	13.03	53.25	1478.
1200	2.65	34.46	1188	27.51	65.6	14.45	69.08	1480.



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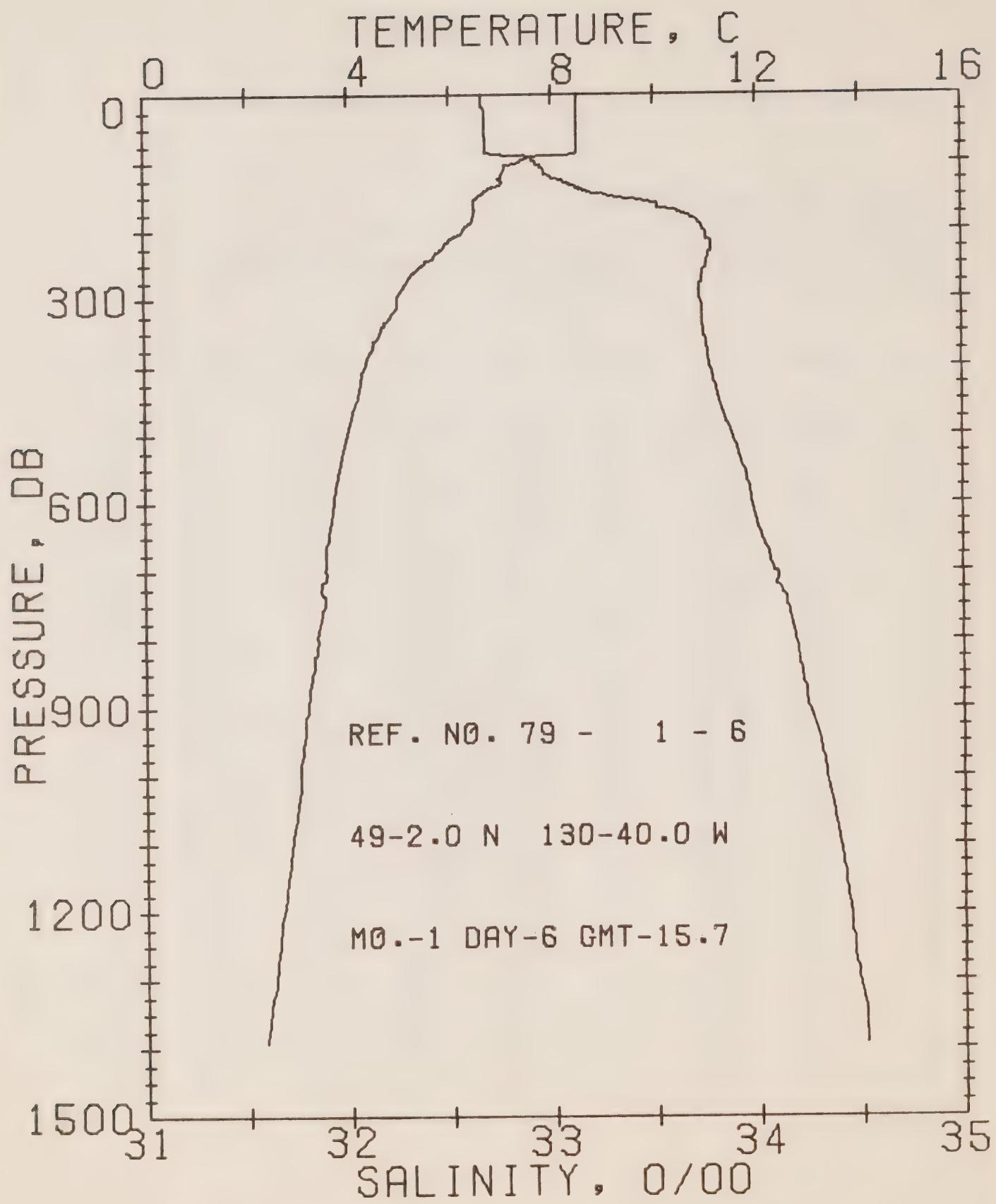
REFERENCE NO. 79-1-6 DATE 6/1/79

POSITION 49-2.0N, 130-40.0A GMT 15.7 STATION 6

RESULTS OF STP CAST 137 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.50	32.66	0	25.39	259.8	.00	.00	1482.
10	8.51	32.66	10	25.39	260.1	.26	.01	1482.
20	8.51	32.66	20	25.39	260.0	.52	.05	1482.
30	8.52	32.67	30	25.39	259.8	.78	.12	1482.
40	8.52	32.67	40	25.39	260.0	1.04	.21	1483.
50	8.52	32.67	50	25.39	260.1	1.30	.33	1483.
60	8.52	32.67	60	25.39	260.3	1.56	.48	1483.
70	8.52	32.68	70	25.40	259.7	1.82	.65	1483.
80	8.52	32.68	80	25.40	259.9	2.08	.85	1483.
90	8.05	32.84	89	25.60	241.4	2.34	1.07	1482.
100	7.35	32.92	99	25.76	226.0	2.57	1.29	1479.
110	7.07	32.95	109	25.82	219.9	2.79	1.53	1478.
120	7.01	32.98	119	25.85	217.2	3.01	1.79	1478.
130	7.02	33.07	129	25.92	210.9	3.22	2.06	1479.
140	6.70	33.14	139	26.01	202.5	3.43	2.34	1478.
150	6.56	33.28	149	26.15	189.6	3.62	2.63	1477.
160	6.48	33.50	159	26.33	172.4	3.81	2.92	1478.
170	6.50	33.58	169	26.39	166.7	3.98	3.21	1478.
180	6.46	33.67	179	26.47	159.6	4.14	3.50	1478.
190	6.37	33.72	189	26.52	155.0	4.30	3.79	1478.
200	6.27	33.74	199	26.55	152.4	4.45	4.10	1478.
210	6.05	33.75	209	26.58	149.0	4.60	4.41	1477.
220	5.91	33.78	219	26.62	145.1	4.75	4.74	1477.
230	5.81	33.76	228	26.64	144.0	4.89	5.07	1476.
240	5.67	33.77	238	26.64	143.2	5.04	5.41	1476.
250	5.45	33.76	248	26.66	141.7	5.18	5.77	1475.
260	5.31	33.74	258	26.66	141.4	5.32	6.13	1475.
270	5.18	33.73	268	26.67	140.7	5.46	6.51	1474.
280	5.10	33.72	278	26.67	140.7	5.60	6.91	1474.
290	5.01	33.72	288	26.68	139.7	5.74	7.32	1474.
300	4.96	33.72	298	26.69	139.2	5.88	7.74	1474.



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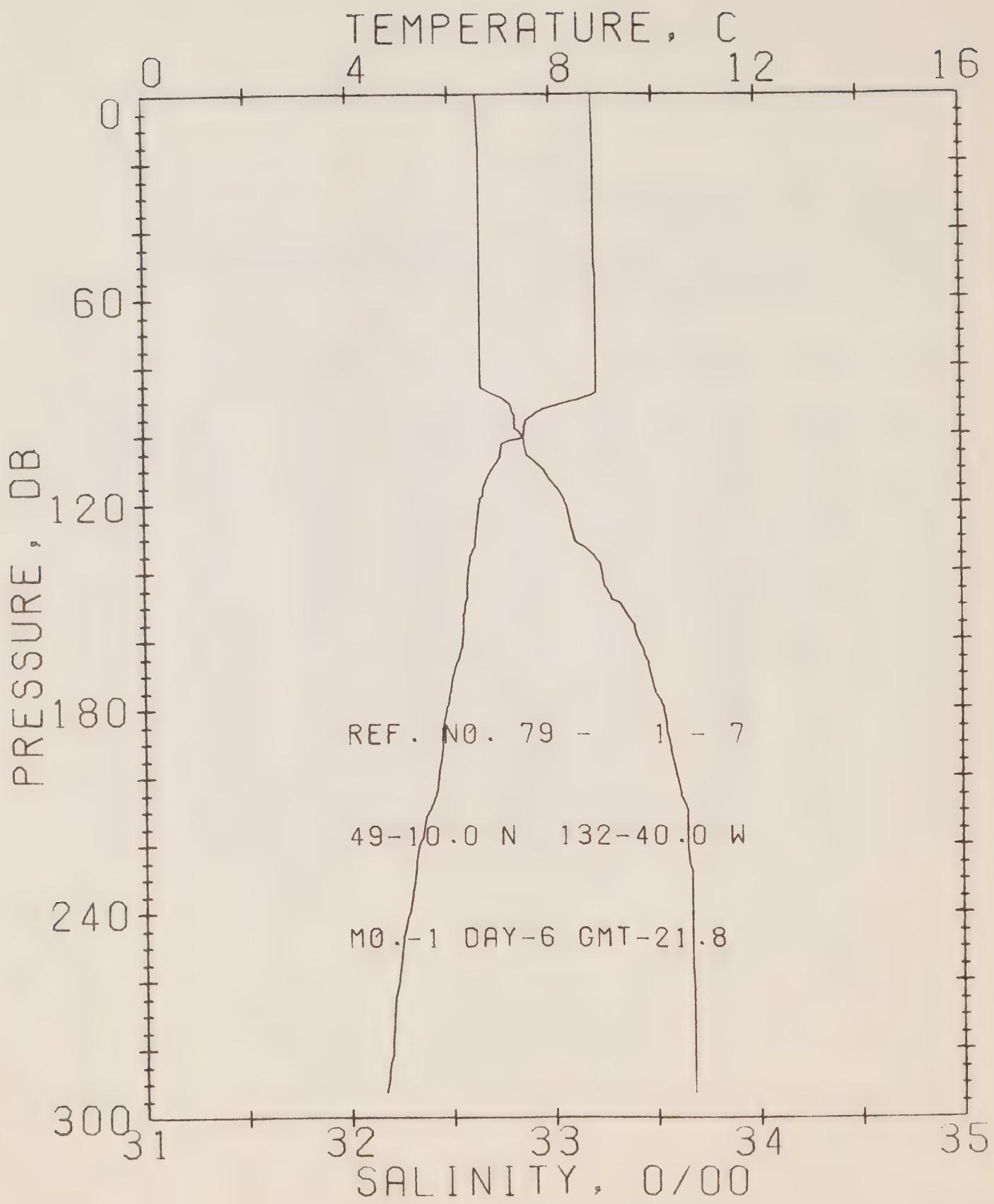
REFERENCE NO. 79- 1- 6 DATE 6/ 1/79

POSITION 49- 2.0N, 130-40.0W GMT 15.7 STATION 6

RESULTS OF STP CAST 261 POINTS TAKEN FROM ANALOG TRACE

GUILDLINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.50	32.66	0	25.39	259.8	.00	.00	1482.
10	8.51	32.66	10	25.39	260.1	.26	.01	1482.
20	8.51	32.66	20	25.39	260.0	.52	.05	1482.
30	8.52	32.67	30	25.39	259.8	.78	.12	1482.
50	8.52	32.67	50	25.39	260.1	1.30	.33	1483.
75	8.52	32.68	75	25.40	259.8	1.95	.75	1483.
100	7.35	32.92	99	25.76	226.0	2.57	1.29	1479.
125	6.98	33.02	124	25.89	214.0	3.12	1.92	1478.
150	6.56	33.28	149	26.15	139.6	3.62	2.63	1477.
175	6.48	33.64	174	26.44	152.1	4.06	3.35	1478.
200	6.27	33.74	199	26.55	152.4	4.45	4.10	1478.
225	5.85	33.78	223	26.63	144.4	4.82	4.90	1477.
250	5.45	33.76	248	26.66	141.7	5.18	5.77	1475.
300	4.96	33.72	293	26.69	139.2	5.88	7.74	1474.
400	4.33	33.77	397	26.80	129.4	7.22	12.52	1473.
500	3.97	33.87	496	26.92	118.7	8.47	18.21	1473.
600	3.69	33.97	595	27.02	109.1	9.60	24.55	1474.
800	3.38	34.16	793	27.22	91.7	11.60	38.77	1476.
1000	3.02	34.33	991	27.37	78.0	13.29	54.26	1478.
1200	2.67	34.45	1198	27.49	66.7	14.74	70.40	1480.



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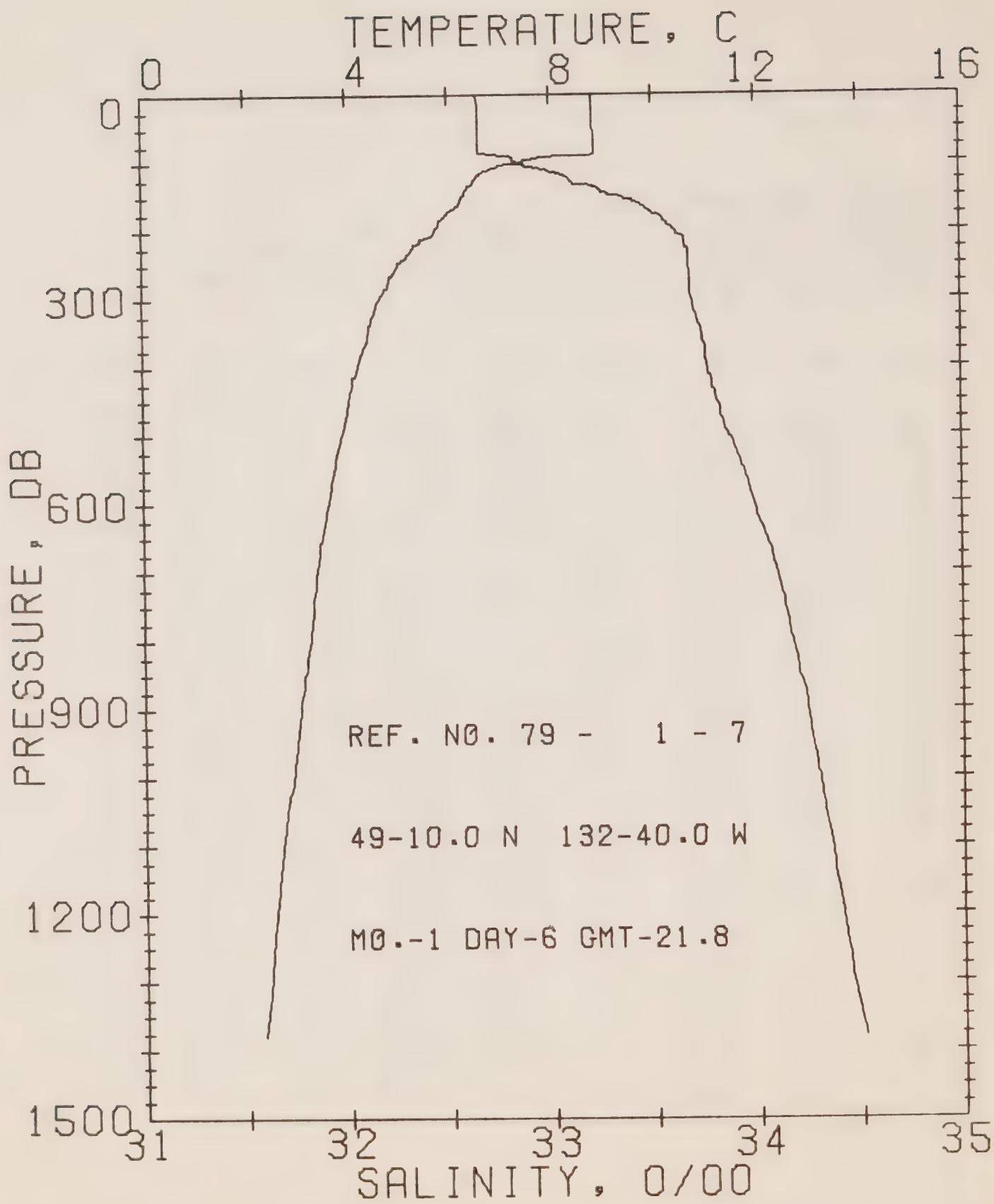
REFERENCE NO. 79-1-7 DATE 6/ 1/79

POSITION 49-10.0N, 132-40.0W GMT 21.8 STATION 7

RESULTS OF STP CAST 55 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.84	32.64	0	25.32	266.2	.00	.00	1483.
10	8.85	32.65	10	25.32	266.0	.27	.01	1483.
20	8.85	32.65	20	25.33	265.9	.53	.05	1483.
30	8.85	32.65	30	25.33	266.1	.80	.12	1484.
40	8.85	32.65	40	25.33	266.3	1.06	.22	1484.
50	8.86	32.65	50	25.33	266.5	1.33	.34	1484.
60	8.87	32.65	60	25.32	267.0	1.60	.49	1484.
70	8.88	32.65	70	25.32	267.2	1.86	.67	1484.
80	8.87	32.65	80	25.32	267.2	2.13	.87	1484.
90	8.51	32.78	99	25.48	252.5	2.40	1.10	1483.
100	7.46	32.86	99	25.69	232.3	2.64	1.33	1480.
110	6.83	32.96	109	25.86	216.4	2.86	1.57	1477.
120	6.58	33.07	119	25.95	205.5	3.07	1.82	1477.
130	6.50	33.11	129	26.02	201.5	3.27	2.08	1477.
140	6.34	33.24	139	26.15	189.5	3.47	2.34	1476.
150	6.27	33.34	149	26.23	181.5	3.66	2.62	1476.
160	6.22	33.42	159	26.30	174.8	3.83	2.90	1476.
170	6.03	33.48	169	26.37	168.2	4.00	3.19	1476.
180	5.89	33.54	179	26.44	162.3	4.17	3.48	1476.
190	5.81	33.57	189	26.47	159.5	4.33	3.79	1476.
200	5.73	33.60	199	26.51	155.9	4.49	4.10	1475.
210	5.54	33.65	209	26.57	150.3	4.64	4.42	1475.
220	5.34	33.65	219	26.59	148.0	4.79	4.75	1474.
230	5.25	33.67	228	26.62	145.6	4.94	5.09	1474.
240	5.15	33.67	238	26.63	144.6	5.08	5.43	1474.
250	5.00	33.67	248	26.64	143.0	5.23	5.79	1473.
260	4.93	33.68	258	26.66	141.8	5.37	6.16	1473.
270	4.85	33.68	268	26.67	140.7	5.51	6.54	1473.
280	4.80	33.68	278	26.66	140.2	5.65	6.94	1473.
290	4.70	33.68	288	26.64	139.2	5.79	7.34	1473.
300	4.62	33.68	298	26.76	138.1	5.93	7.76	1473.



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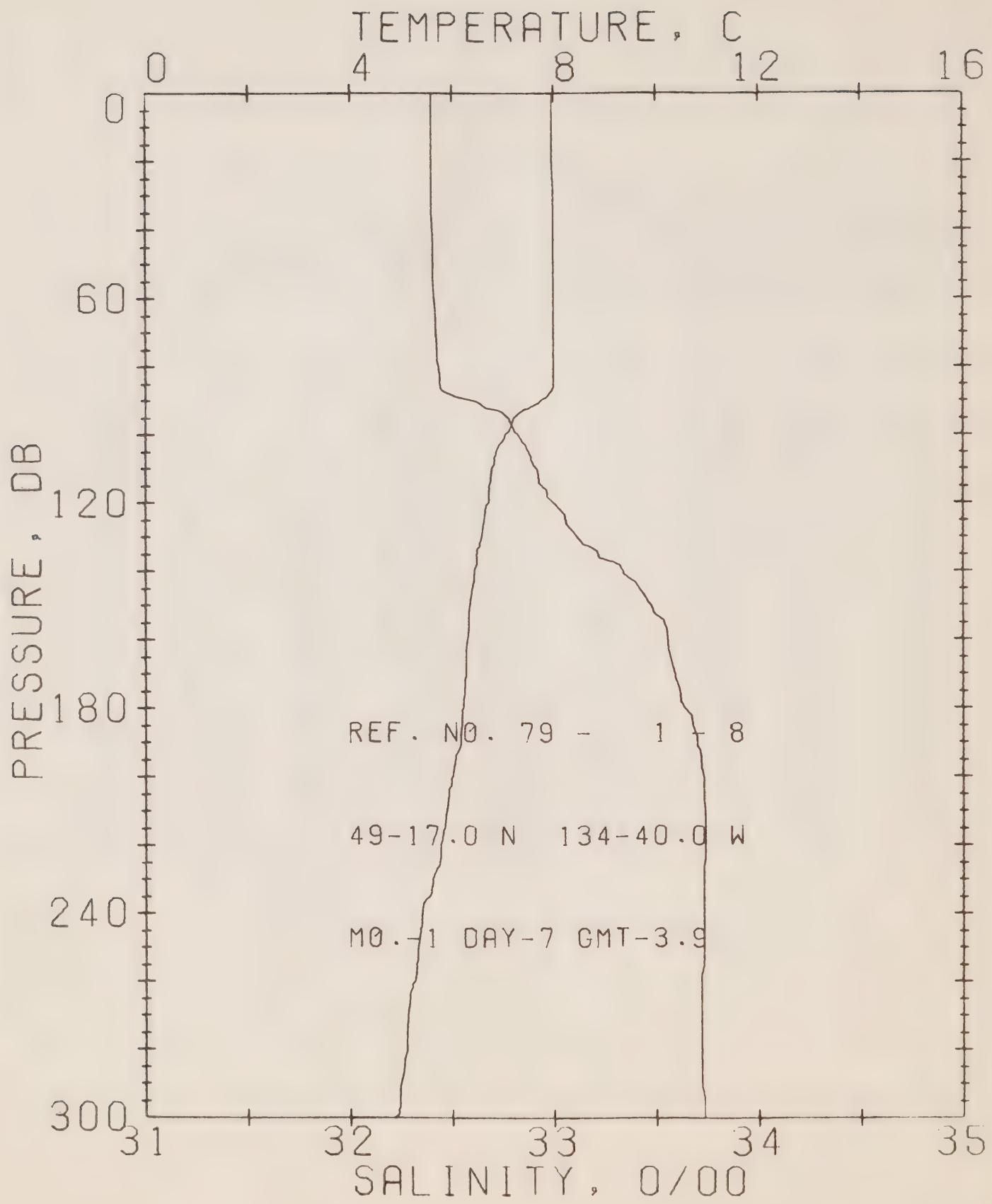
REFERENCE NO. 79- 1- 7 DATE 6/ 1/79

POSITION 49-10.0N, 132-40.0E GMT 21.8 STATION 7

RESULTS OF STD CAST 206 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.84	32.64	0	25.32	266.2	.00	.00	1483.
10	8.85	32.65	10	25.32	266.0	.27	.01	1483.
20	8.85	32.65	20	25.33	265.9	.53	.05	1483.
30	8.85	32.65	30	25.33	266.1	.80	.12	1484.
50	8.86	32.65	50	25.33	266.5	1.33	.34	1484.
75	8.88	32.65	75	25.32	267.2	2.00	.76	1484.
100	7.40	32.80	99	26.60	232.3	2.64	1.33	1480.
125	6.53	33.08	124	26.06	213.6	3.17	1.94	1477.
150	6.27	33.34	149	26.23	181.5	3.66	2.62	1476.
175	5.97	33.50	174	26.40	166.2	4.09	3.34	1476.
200	5.73	33.66	199	26.51	155.9	4.49	4.10	1475.
225	5.29	33.66	223	26.60	146.8	4.86	4.92	1474.
250	5.00	33.67	248	26.64	143.0	5.23	5.79	1473.
300	4.62	33.66	298	26.70	138.1	5.93	7.76	1473.
400	4.21	33.70	397	26.81	128.6	7.26	12.50	1473.
500	3.88	33.87	496	26.92	118.3	8.49	18.15	1473.
600	3.62	33.99	595	27.04	107.4	9.61	24.43	1474.
600	3.24	34.17	793	27.22	90.9	11.58	38.37	1476.
1000	2.88	34.30	991	27.36	78.8	13.27	53.85	1478.
1200	2.53	34.41	1138	27.48	67.9	14.73	70.21	1479.



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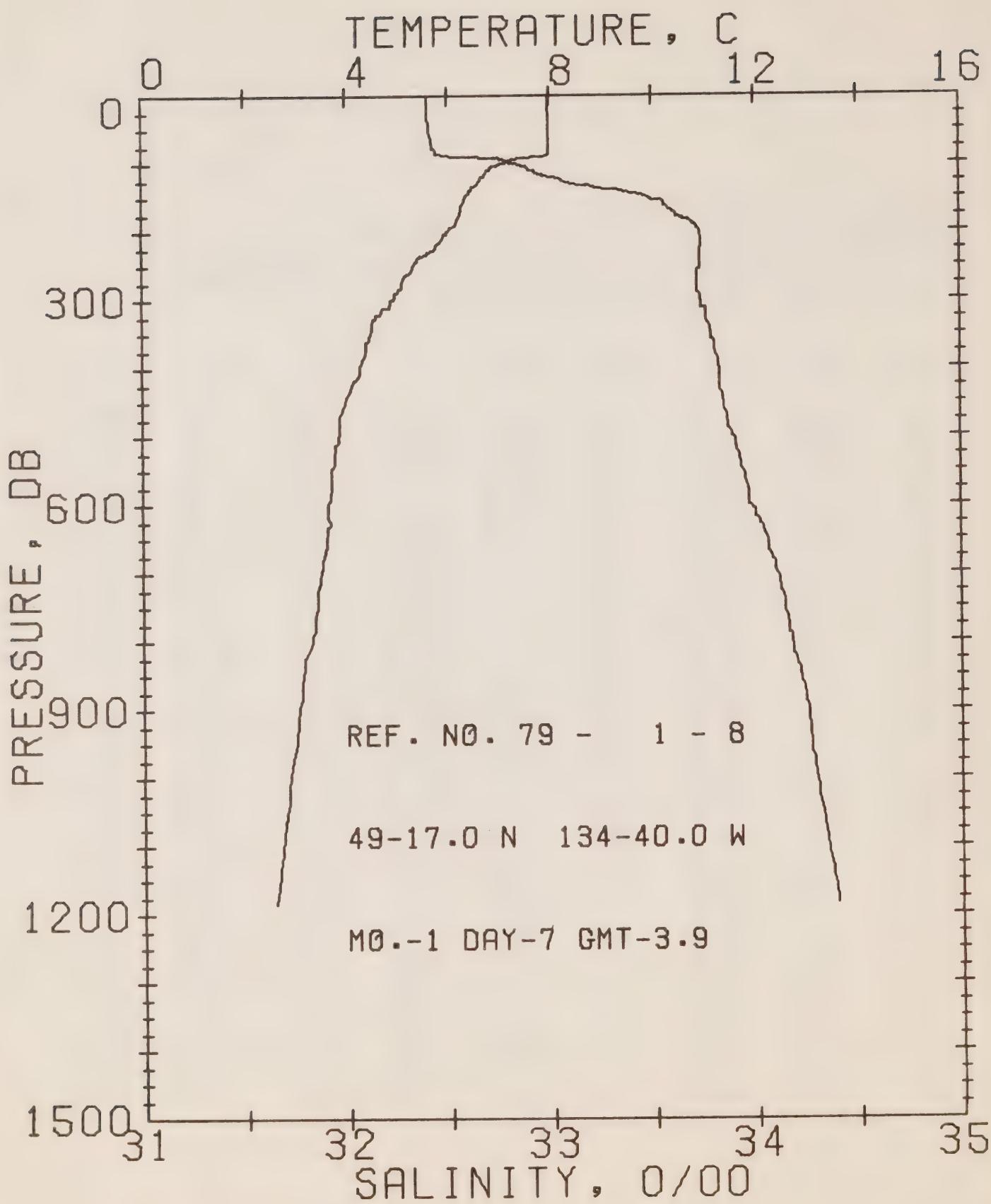
REFERENCE NO. 79- 1- 8 DATE 7/ 1/79

POSITION 49-17.0N, 134-40.0W GMT 3.9 STATION 8

RESULTS OF STP CAST 105 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.98	32.40	0	25.26	271.8	.00	.00	1479.
10	7.98	32.40	10	25.26	272.0	.27	.01	1480.
20	7.98	32.40	20	25.26	272.1	.54	.06	1480.
30	7.99	32.40	30	25.26	272.4	.82	.12	1480.
40	7.99	32.41	40	25.26	272.1	1.09	.22	1480.
50	8.00	32.41	50	25.27	272.0	1.36	.35	1480.
60	8.00	32.41	60	25.27	271.9	1.63	.50	1481.
70	8.00	32.42	70	25.28	271.4	1.90	.68	1481.
80	8.00	32.43	80	25.29	270.7	2.18	.89	1481.
90	7.73	32.61	89	25.46	254.1	2.44	1.12	1480.
100	7.03	32.83	99	25.73	228.5	2.68	1.35	1478.
110	6.78	32.92	109	25.83	218.7	2.91	1.59	1477.
120	6.71	33.00	119	25.91	212.0	3.12	1.84	1477.
130	6.56	33.12	129	26.02	201.6	3.33	2.10	1477.
140	6.44	33.34	139	26.21	133.5	3.52	2.37	1477.
150	6.34	33.48	149	26.32	171.9	3.70	2.63	1477.
160	6.30	33.55	159	26.40	165.9	3.87	2.90	1477.
170	6.26	33.59	169	26.43	163.0	4.03	3.17	1477.
180	6.22	33.64	179	26.47	158.9	4.19	3.46	1477.
190	6.16	33.70	189	26.53	153.8	4.35	3.76	1477.
200	6.00	33.73	199	26.57	149.7	4.50	4.06	1477.
210	5.88	33.74	209	26.59	147.8	4.65	4.37	1476.
220	5.77	33.74	219	26.61	146.4	4.79	4.69	1476.
230	5.61	33.73	228	26.62	145.4	4.94	5.03	1476.
240	5.41	33.73	238	26.65	143.0	5.09	5.37	1475.
250	5.32	33.73	248	26.66	142.1	5.23	5.73	1475.
260	5.24	33.72	258	26.66	142.1	5.37	6.10	1475.
270	5.11	33.72	268	26.67	140.7	5.51	6.48	1474.
280	5.09	33.72	278	26.67	140.6	5.65	6.87	1474.
290	4.98	33.72	288	26.69	139.4	5.79	7.28	1474.
300	4.89	33.73	298	26.70	137.7	5.93	7.69	1474.



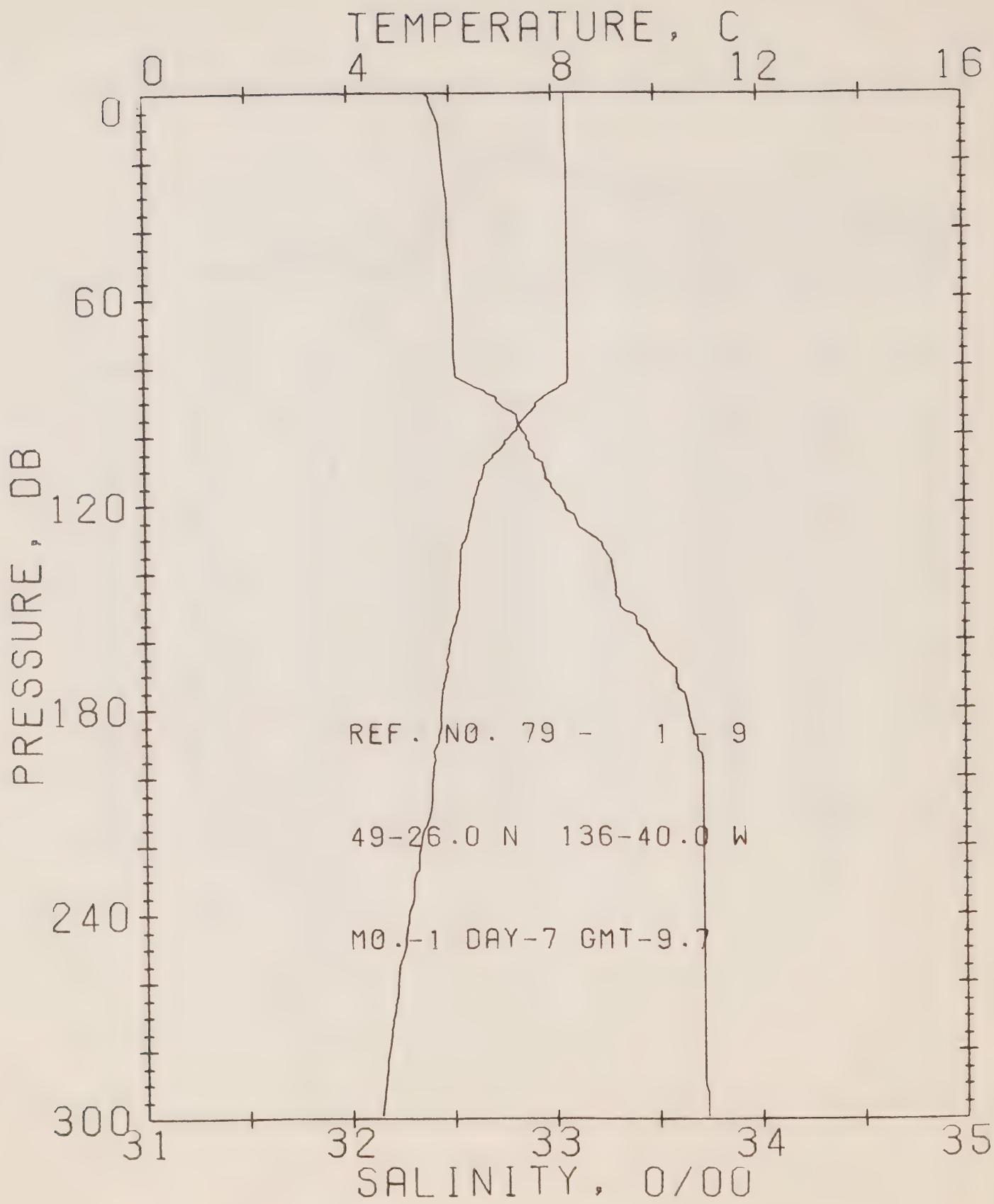
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 8 DATE 7/ 1/79

POSITION 49-17.0N, 134-40.0W GMT 3.9 STATION 8

RESULTS OF STP CAST 275 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA-	SVA	DELTA	POT.	SOUND
				T	D	EN		
0	7.98	32.40	0	25.26	271.8	.00	.00	1479.
10	7.98	32.40	10	25.26	272.0	.27	.01	1480.
20	7.98	32.40	20	25.26	272.1	.54	.06	1480.
30	7.99	32.40	30	25.26	272.4	.82	.12	1480.
50	8.00	32.41	50	25.27	272.0	1.36	.35	1480.
75	8.00	32.43	75	25.24	271.0	2.04	.78	1481.
100	7.03	32.83	99	25.73	228.5	2.68	1.35	1478.
125	6.62	33.06	124	25.96	206.6	3.23	1.97	1477.
150	6.34	33.48	149	26.33	171.9	3.70	2.63	1477.
175	6.24	33.61	174	26.45	160.9	4.11	3.32	1477.
200	6.00	33.73	199	26.57	149.7	4.50	4.06	1477.
225	5.75	33.74	223	26.61	146.5	4.87	4.86	1476.
250	5.32	33.73	248	26.66	142.1	5.23	5.73	1475.
300	4.89	33.73	298	26.70	137.7	5.93	7.69	1474.
400	4.28	33.82	397	26.85	124.9	7.23	12.32	1473.
500	3.83	33.89	496	26.95	115.8	8.44	17.84	1473.
600	3.53	33.97	595	27.03	108.4	9.55	24.10	1474.
800	3.30	34.17	793	27.22	91.5	11.53	38.14	1476.
1000	2.86	34.29	991	27.35	79.1	13.21	53.56	1477.
1200	2.57	34.39	1188	27.46	69.8	14.70	70.16	1480.



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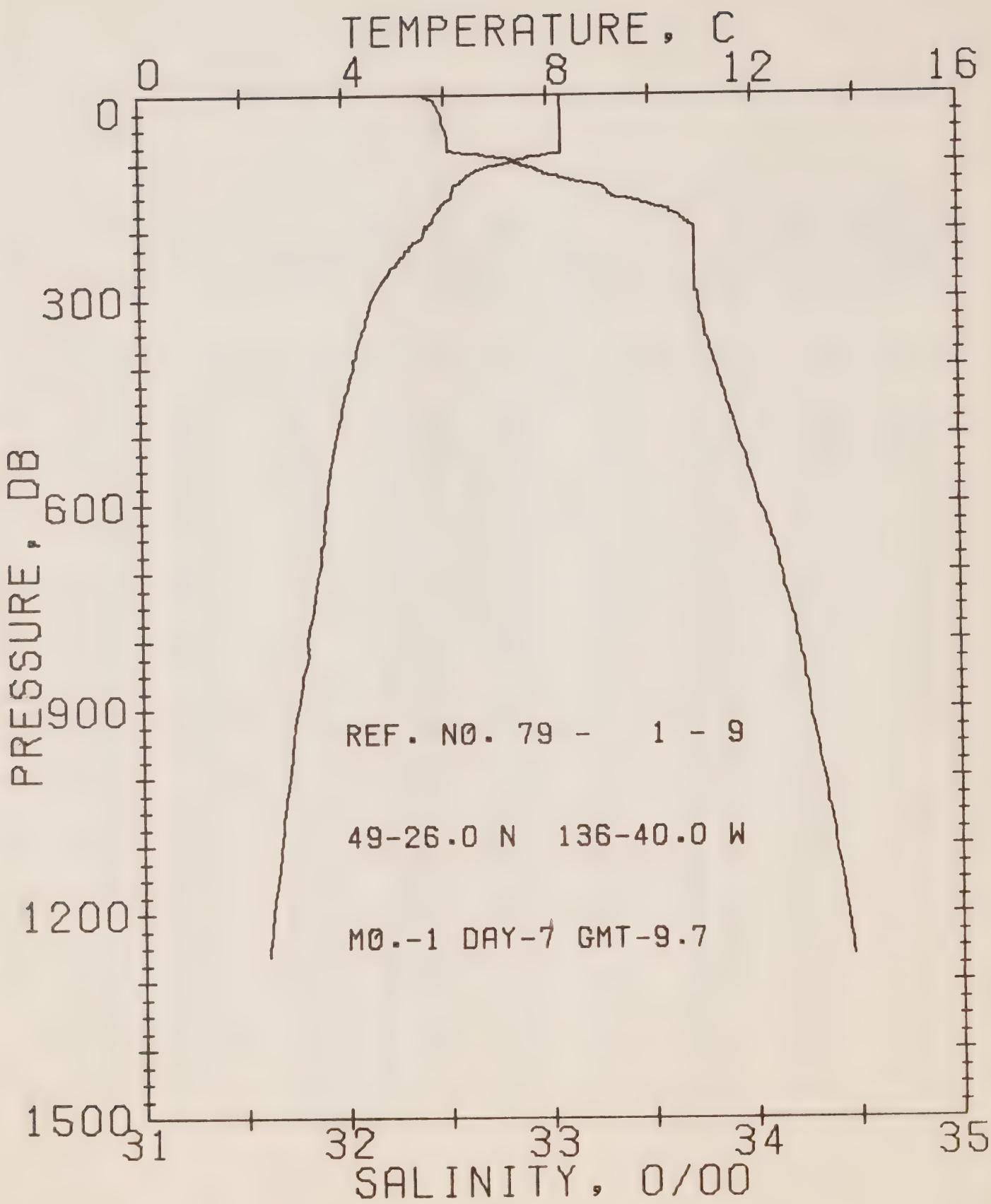
REFERENCE NO. 79- 1- 9 DATE 7/ 1/79

POSITION 49-26.0N, 136-40.0W GMT 9.7 STATION 9

RESULTS OF STP CAST 145 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.27	32.38	0	25.20	277.3	.00	.00	1481.
10	8.27	32.45	10	25.26	272.2	.27	.01	1481.
20	8.29	32.47	20	25.27	271.4	.55	.06	1481.
30	8.29	32.49	30	25.28	270.2	.82	.12	1481.
40	8.29	32.49	40	25.29	270.0	1.09	.22	1481.
50	8.29	32.50	50	25.29	269.5	1.36	.34	1482.
60	8.29	32.51	60	25.30	269.1	1.63	.50	1482.
70	8.29	32.51	70	25.30	269.0	1.90	.67	1482.
80	8.29	32.52	80	25.31	268.4	2.16	.88	1482.
90	7.73	32.72	89	25.55	245.9	2.42	1.11	1480.
100	7.18	32.87	99	25.74	227.5	2.66	1.33	1479.
110	6.63	32.95	109	25.88	214.2	2.88	1.57	1477.
120	6.42	33.05	119	25.98	204.6	3.09	1.82	1476.
130	6.26	33.20	129	26.12	191.4	3.29	2.07	1476.
140	6.14	33.29	139	26.21	183.6	3.48	2.33	1476.
150	6.14	33.32	149	26.23	161.4	3.66	2.60	1476.
160	5.94	33.47	159	26.38	167.9	3.83	2.87	1475.
170	5.86	33.59	169	26.48	158.1	4.00	3.14	1475.
180	5.77	33.65	179	26.54	152.9	4.15	3.42	1475.
190	5.70	33.69	189	26.58	148.9	4.30	3.71	1475.
200	5.60	33.72	199	26.61	145.6	4.45	4.00	1475.
210	5.55	33.72	209	26.62	145.2	4.59	4.30	1475.
220	5.35	33.72	218	26.64	142.9	4.74	4.62	1474.
230	5.21	33.72	228	26.66	141.4	4.88	4.94	1474.
240	5.12	33.72	238	26.67	140.4	5.02	5.28	1474.
250	5.01	33.72	248	26.68	139.4	5.16	5.63	1473.
260	4.89	33.72	258	26.70	138.1	5.30	5.99	1473.
270	4.80	33.72	268	26.71	137.2	5.44	6.36	1473.
280	4.72	33.72	278	26.71	136.3	5.57	6.75	1473.
290	4.63	33.72	288	26.73	135.5	5.71	7.14	1473.
300	4.56	33.73	298	26.74	134.0	5.85	7.54	1472.



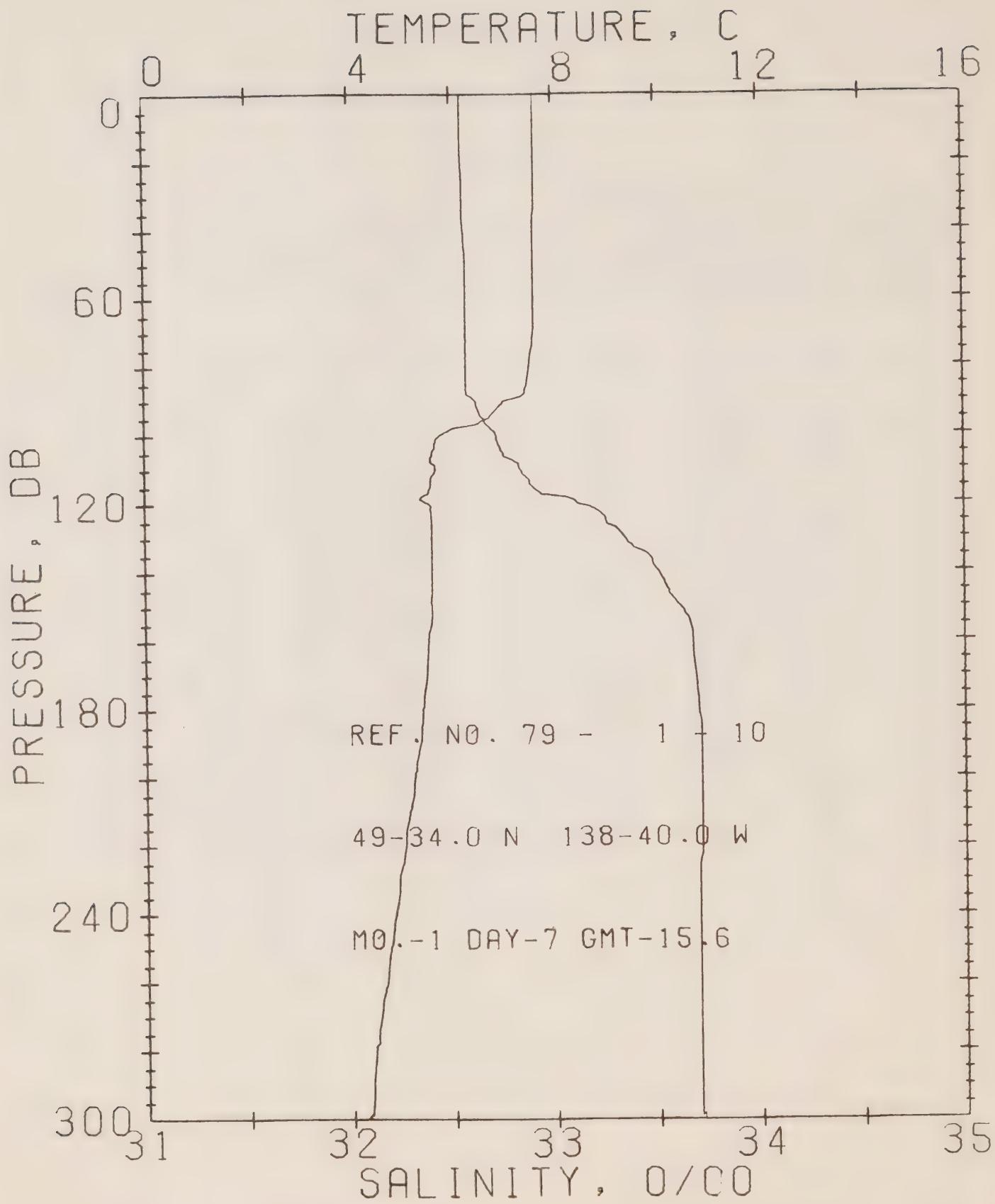
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REFERENCE NO. 79- 1- 9 DATE 7/ 1/79

POSITION 49-26.0N, 136-40.0W GMT 9.7 STATION 9

RESULTS OF STD CAST 261 POINTS TAKEN FROM ANALOG TRACE
GUILDLINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	8.27	32.38	0	25.20	277.3	.00	.00	1481.
10	8.27	32.45	10	25.26	272.2	.27	.01	1481.
20	8.29	32.47	20	25.27	271.4	.55	.06	1481.
30	8.29	32.49	30	25.28	270.2	.82	.12	1481.
50	8.29	32.50	50	25.29	269.5	1.36	.34	1482.
75	8.29	32.51	75	25.30	269.1	2.03	.77	1482.
100	7.18	32.87	99	25.74	227.5	2.66	1.33	1479.
125	6.30	33.11	124	26.04	199.4	3.19	1.94	1476.
150	6.14	33.32	149	26.23	181.4	3.66	2.60	1476.
175	5.79	33.63	174	26.52	154.3	4.07	3.28	1475.
200	5.60	33.72	199	26.61	145.6	4.45	4.00	1475.
225	5.30	33.72	223	26.65	142.4	4.81	4.78	1474.
250	5.01	33.72	248	26.68	139.4	5.16	5.63	1473.
300	4.50	33.73	298	26.74	134.0	5.85	7.54	1472.
400	4.18	33.82	397	26.85	124.0	7.14	12.14	1473.
500	3.84	33.92	496	26.97	113.9	8.32	17.58	1473.
600	3.63	34.02	595	27.06	105.1	9.41	23.69	1474.
700	3.22	34.21	793	27.26	87.9	11.33	37.32	1476.
1000	2.84	34.35	991	27.39	76.0	12.97	52.33	1477.
1200	2.51	34.44	1188	27.50	65.4	14.38	68.10	1479.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 10

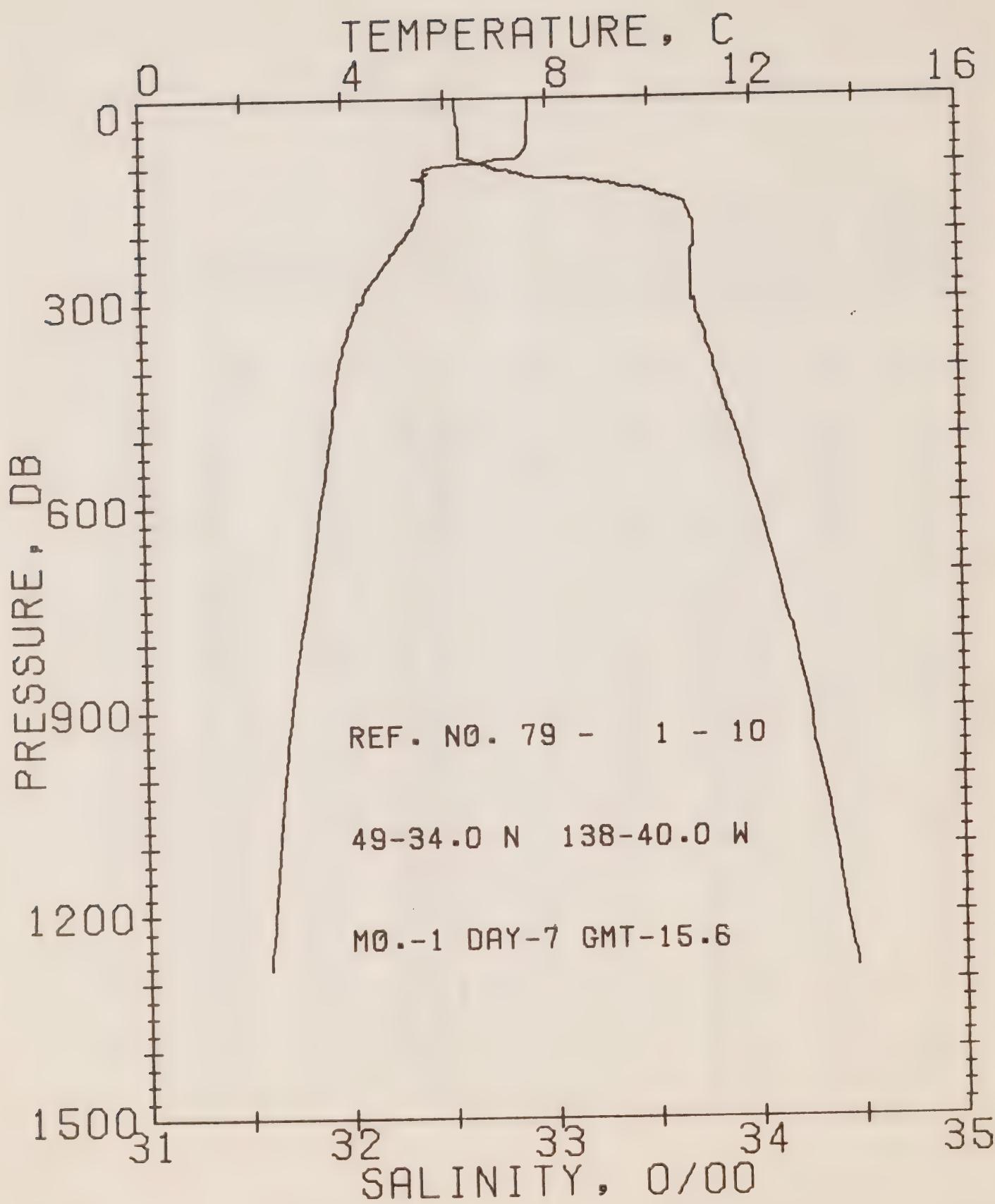
DATE 7/ 1/79

POSITION 49-34.0N, 138-40.0W GMT 15.6 STATION 10

RESULTS OF STP CAST 144 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.66	32.55	0	25.42	256.3	.00	.00	1478.
10	7.65	32.55	10	25.43	256.3	.26	.01	1479.
20	7.65	32.55	20	25.43	256.1	.51	.05	1479.
30	7.65	32.56	30	25.43	255.8	.77	.12	1479.
40	7.64	32.56	40	25.44	255.7	1.02	.21	1479.
50	7.64	32.57	50	25.44	255.3	1.28	.33	1479.
60	7.63	32.57	60	25.44	255.3	1.53	.47	1479.
70	7.62	32.57	70	25.45	255.2	1.79	.64	1479.
80	7.53	32.57	80	25.46	254.1	2.04	.83	1479.
90	7.02	32.62	89	25.57	243.9	2.30	1.05	1477.
100	5.75	32.72	99	25.81	220.9	2.53	1.28	1473.
110	5.69	32.84	109	25.91	211.4	2.75	1.51	1473.
120	5.55	33.11	119	26.14	189.7	2.95	1.75	1473.
130	5.60	33.35	129	26.32	172.5	3.13	1.98	1473.
140	5.60	33.51	139	26.45	160.6	3.30	2.20	1474.
150	5.59	33.62	149	26.54	152.4	3.45	2.44	1474.
160	5.52	33.67	159	26.59	147.8	3.60	2.67	1474.
170	5.47	33.69	169	26.60	146.3	3.75	2.92	1474.
180	5.38	33.70	179	26.62	144.3	3.90	3.18	1474.
190	5.34	33.71	189	26.64	143.2	4.04	3.45	1474.
200	5.22	33.71	199	26.65	142.0	4.18	3.73	1473.
210	5.12	33.71	209	26.66	140.9	4.32	4.03	1473.
220	5.04	33.71	218	26.67	140.1	4.46	4.34	1473.
230	4.92	33.70	228	26.68	139.5	4.60	4.66	1473.
240	4.84	33.70	238	26.69	138.8	4.74	4.99	1473.
250	4.72	33.70	248	26.70	137.6	4.88	5.34	1472.
260	4.65	33.70	258	26.71	136.9	5.02	5.69	1472.
270	4.53	33.70	268	26.72	135.7	5.15	6.06	1472.
280	4.44	33.70	278	26.73	134.8	5.29	6.44	1472.
290	4.38	33.70	288	26.74	134.2	5.42	6.83	1471.
300	4.28	33.71	298	26.76	132.5	5.56	7.23	1471.



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REFERENCE NO. 79- 1- 10

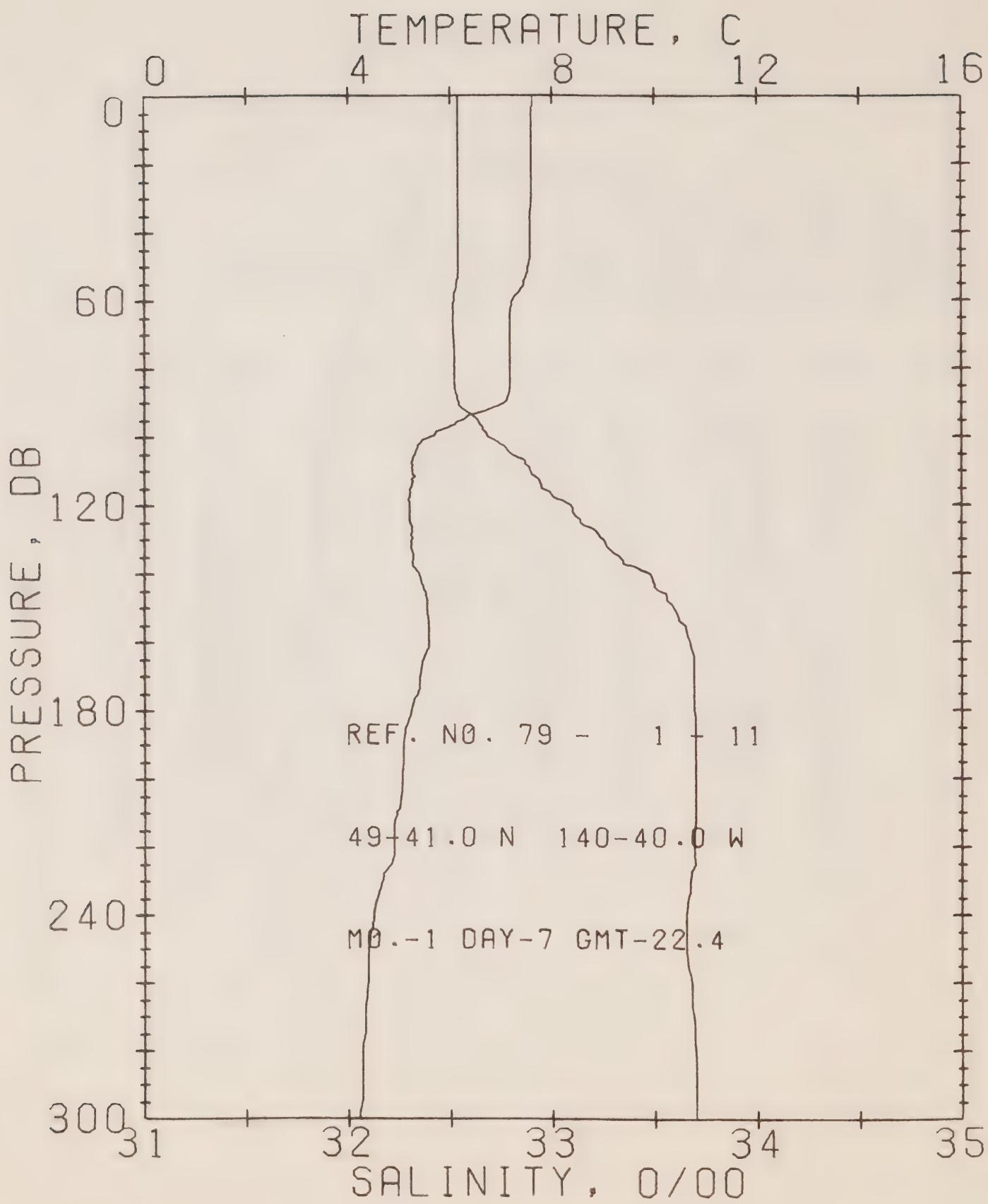
DATE 7/ 1/79

POSITION 49-34.0N, 138-40.0W GMT 15.6 STATION 10

RESULTS OF STP CAST 222 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.60	32.55	0	25.42	256.3	.00	.00	1478.
10	7.65	32.55	10	25.43	256.3	.26	.01	1479.
20	7.65	32.55	20	25.43	256.1	.51	.05	1479.
30	7.65	32.56	30	25.43	255.8	.77	.12	1479.
50	7.64	32.57	50	25.44	255.3	1.28	.33	1479.
75	7.57	32.57	75	25.45	254.7	1.92	.73	1479.
100	5.75	32.72	99	25.81	220.9	2.53	1.28	1473.
125	5.59	33.25	124	26.24	179.8	3.04	1.86	1473.
150	5.59	33.62	149	26.54	152.4	3.45	2.44	1474.
175	5.43	33.69	174	26.61	145.3	3.82	3.05	1474.
200	5.22	33.71	199	26.65	142.0	4.18	3.73	1473.
225	4.99	33.76	223	26.67	140.3	4.53	4.50	1473.
250	4.72	33.76	248	26.70	137.6	4.88	5.34	1472.
300	4.28	33.71	298	26.76	132.5	5.56	7.23	1471.
400	3.85	33.80	397	26.87	122.1	6.83	11.74	1471.
500	3.67	33.92	496	26.98	112.0	8.00	17.11	1472.
600	3.46	34.01	595	27.07	103.9	9.08	23.17	1473.
800	3.03	34.18	793	27.25	87.9	11.00	36.81	1475.
1000	2.70	34.31	990	27.39	75.9	12.63	51.76	1477.
1200	2.47	34.42	1188	27.49	66.6	14.05	67.63	1479.



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REFERENCE NO. 79- 1- 11

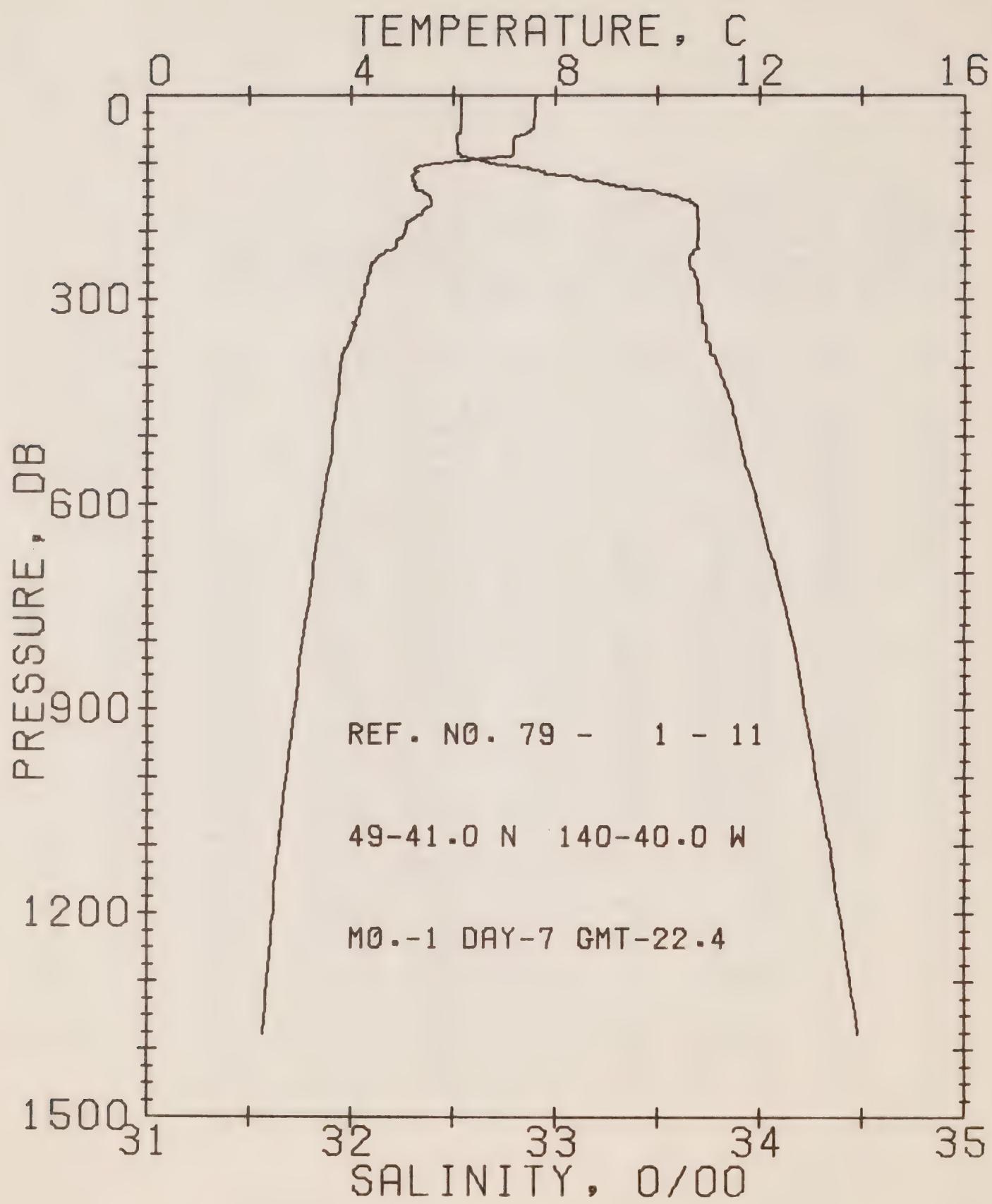
DATE 7/ 1/79

POSITION 49-41.0N, 140-40.0W GMT 22.4 STATION 11

RESULTS OF STP CAST 159 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.62	32.54	0	25.42	256.5	.00	.00	1478.
10	7.60	32.54	10	25.42	256.4	.26	.01	1478.
20	7.60	32.54	20	25.42	256.5	.51	.05	1478.
30	7.59	32.54	30	25.43	256.5	.77	.12	1479.
40	7.57	32.54	40	25.43	256.5	1.03	.21	1479.
50	7.54	32.54	50	25.43	256.1	1.28	.33	1479.
60	7.23	32.52	60	25.46	253.7	1.54	.47	1478.
70	7.18	32.51	70	25.46	253.6	1.79	.64	1478.
80	7.16	32.52	80	25.47	253.0	2.04	.83	1478.
90	7.09	32.54	89	25.50	250.8	2.30	1.05	1478.
100	5.67	32.68	99	25.79	223.0	2.53	1.28	1472.
110	5.25	32.89	109	26.00	202.3	2.74	1.50	1471.
120	5.19	33.09	119	26.16	187.1	2.94	1.73	1471.
130	5.26	33.25	129	26.28	176.0	3.12	1.97	1472.
140	5.40	33.48	139	26.45	160.5	3.29	2.20	1473.
150	5.54	33.59	149	26.52	154.1	3.45	2.43	1474.
160	5.58	33.67	159	26.58	148.7	3.60	2.67	1474.
170	5.41	33.69	169	26.61	145.2	3.75	2.92	1474.
180	5.23	33.69	179	26.63	143.3	3.89	3.17	1473.
190	5.07	33.70	189	26.66	140.9	4.03	3.44	1473.
200	5.04	33.70	199	26.66	140.6	4.17	3.72	1473.
210	4.94	33.70	209	26.68	139.6	4.31	4.02	1472.
220	4.87	33.69	218	26.68	139.7	4.45	4.32	1472.
230	4.66	33.67	228	26.68	139.0	4.59	4.64	1472.
240	4.49	33.65	238	26.69	138.7	4.73	4.97	1471.
250	4.37	33.65	248	26.70	137.5	4.87	5.32	1471.
260	4.36	33.66	258	26.72	135.3	5.01	5.67	1471.
270	4.32	33.69	268	26.73	134.5	5.14	6.04	1471.
280	4.28	33.69	278	26.74	133.6	5.28	6.41	1471.
290	4.27	33.70	288	26.75	133.1	5.41	6.80	1471.
300	4.21	33.70	298	26.76	132.5	5.54	7.20	1471.



OFFSHORE OCEANOGRAPHY GROUP

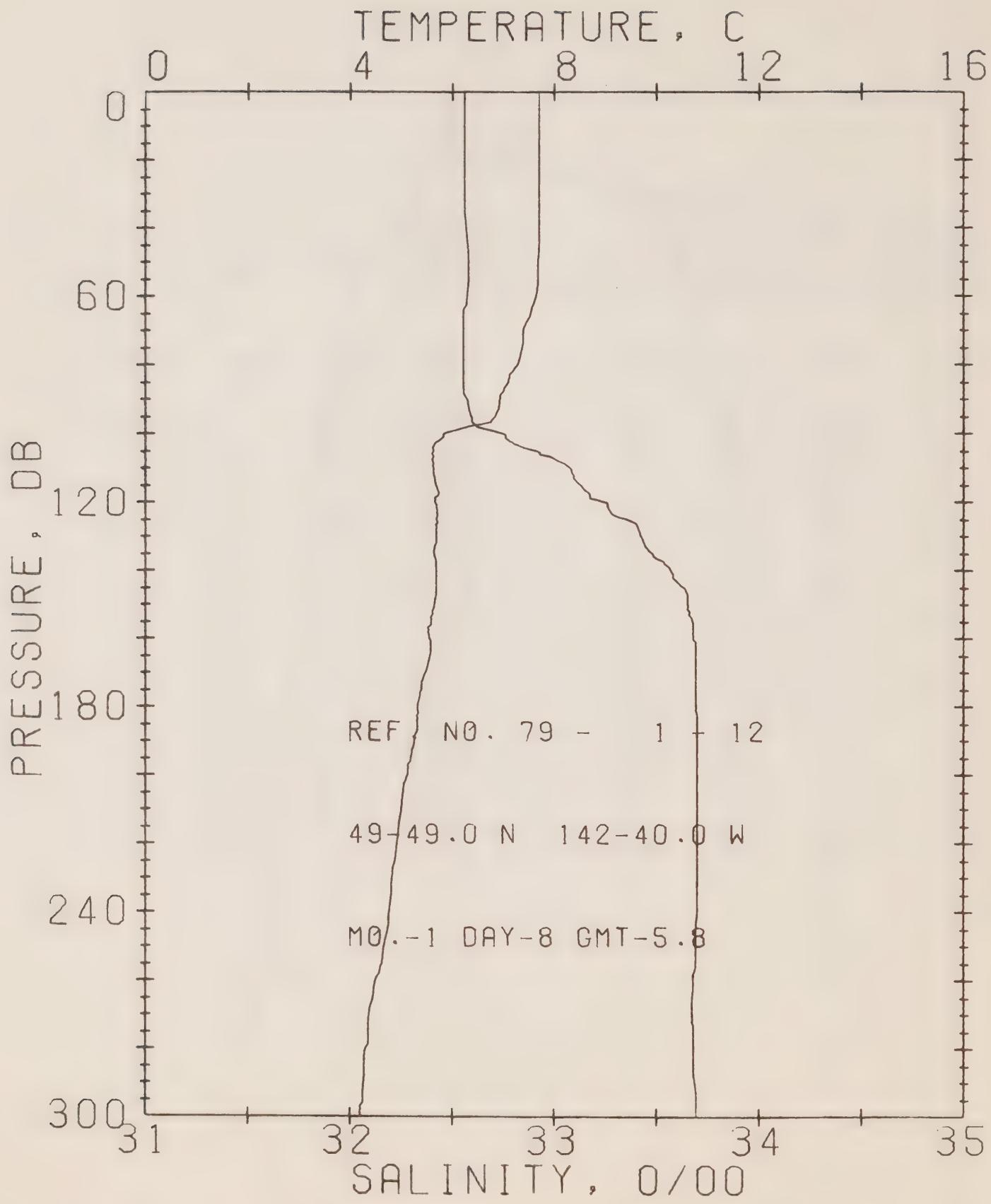
REFERENCE NO. 79- 1- 11 DATE 7/ 1/79

POSITION 49-41.0N, 140-40.0W GMT 22.4 STATION 11

RESULTS OF STP CAST 257 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.62	32.54	0	25.42	256.5	.00	.00	1478.
10	7.60	32.54	10	25.42	256.4	.26	.01	1478.
20	7.60	32.54	20	25.42	256.5	.51	.05	1478.
30	7.59	32.54	30	25.43	256.5	.77	.12	1479.
50	7.54	32.54	50	25.43	256.1	1.23	.33	1479.
75	7.17	32.52	75	25.47	253.1	1.92	.73	1478.
100	5.67	32.68	99	25.79	223.0	2.53	1.28	1472.
125	5.21	33.14	124	26.20	183.6	3.03	1.85	1471.
150	5.54	33.59	149	26.52	154.1	3.45	2.43	1474.
175	5.37	33.69	174	26.62	144.8	3.82	3.04	1474.
200	5.04	33.70	199	26.66	140.6	4.17	3.72	1473.
225	4.82	33.70	223	26.69	138.4	4.52	4.48	1472.
250	4.37	33.65	248	26.70	137.5	4.87	5.32	1471.
300	4.21	33.70	298	26.75	132.5	5.54	7.20	1471.
400	3.79	33.80	397	26.88	121.5	6.82	11.74	1471.
500	3.63	33.90	496	26.97	113.2	7.99	17.10	1472.
600	3.44	33.99	595	27.06	105.4	9.08	23.22	1473.
800	3.04	34.16	793	27.23	89.6	11.03	37.06	1475.
1000	2.72	34.20	990	27.35	78.8	12.71	52.45	1477.
1200	2.46	34.39	1188	27.47	68.4	14.17	68.84	1479.



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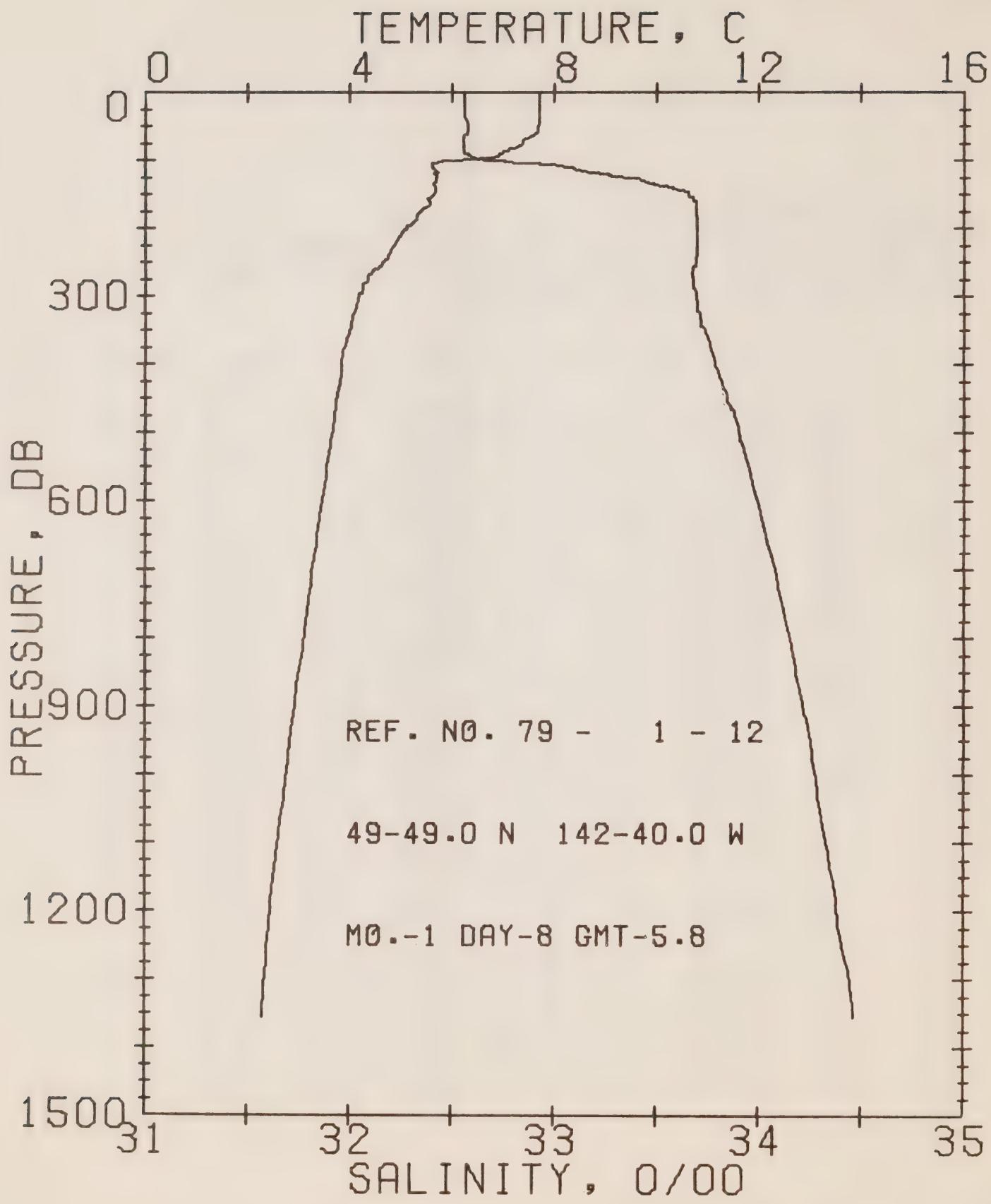
REFERENCE NO. 79- 1- 12 DATE 8/ 1/79

POSITION 49-49.0N, 142-40.0W GMT 5.8 STATION 12

RESULTS OF STP CAST 155 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.70	32.56	0	25.43	256.1	.00	.00	1479.
10	7.70	32.56	10	25.43	256.2	.26	.01	1479.
20	7.70	32.56	20	25.43	256.4	.51	.05	1479.
30	7.70	32.56	30	25.43	256.5	.77	.12	1479.
40	7.70	32.57	40	25.43	256.3	1.03	.21	1479.
50	7.69	32.58	50	25.44	255.2	1.28	.33	1479.
60	7.65	32.57	60	25.44	255.5	1.54	.47	1479.
70	7.40	32.55	70	25.46	253.8	1.79	.64	1479.
80	7.28	32.55	80	25.48	252.4	2.04	.83	1478.
90	6.93	32.57	89	25.54	246.5	2.29	1.05	1477.
100	5.82	32.76	99	25.83	218.8	2.54	1.28	1473.
110	5.63	33.08	109	26.11	192.8	2.74	1.50	1473.
120	5.66	33.26	119	26.24	179.8	2.93	1.72	1473.
130	5.67	33.43	129	26.38	167.3	3.10	1.94	1474.
140	5.67	33.57	139	26.49	157.0	3.27	2.17	1474.
150	5.64	33.65	149	26.55	150.7	3.42	2.40	1474.
160	5.54	33.68	159	26.59	147.4	3.57	2.63	1474.
170	5.46	33.69	169	26.61	145.9	3.72	2.88	1474.
180	5.31	33.69	179	26.62	144.3	3.86	3.14	1473.
190	5.25	33.70	189	26.64	142.9	4.00	3.41	1473.
200	5.11	33.70	199	26.66	141.4	4.15	3.69	1473.
210	4.99	33.70	209	26.67	140.1	4.29	3.98	1473.
220	4.91	33.70	218	26.68	139.4	4.43	4.29	1472.
230	4.82	33.70	228	26.69	138.5	4.57	4.61	1472.
240	4.76	33.70	238	26.70	137.9	4.70	4.94	1472.
250	4.66	33.69	248	26.70	137.7	4.84	5.28	1472.
260	4.49	33.68	258	26.71	136.7	4.98	5.64	1471.
270	4.37	33.67	268	26.71	136.2	5.12	6.01	1471.
280	4.31	33.68	278	26.73	134.9	5.25	6.39	1471.
290	4.26	33.68	288	26.74	134.2	5.39	6.78	1471.
300	4.18	33.69	298	26.75	133.0	5.52	7.18	1471.



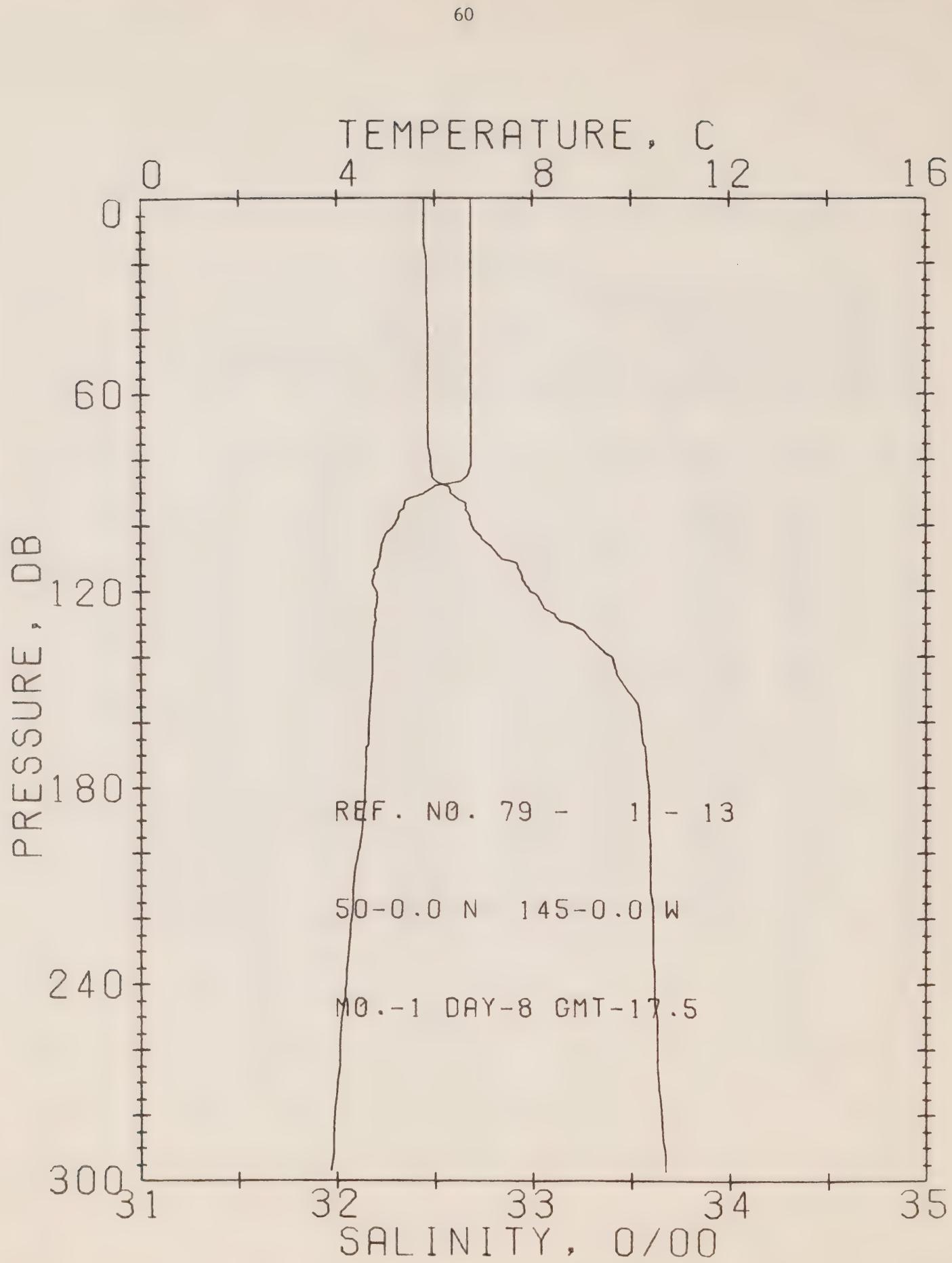
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 12 DATE 8/ 1/79

POSITION 49-49.0N, 142-40.0W GMT 5.8 STATION 12

RESULTS OF STP CAST 206 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.70	32.56	0	25.43	256.1	.00	.00	1479.
10	7.70	32.56	10	25.43	256.2	.26	.01	1479.
20	7.70	32.56	20	25.43	256.4	.51	.05	1479.
30	7.70	32.56	30	25.43	256.5	.77	.12	1479.
50	7.69	32.58	50	25.44	255.2	1.28	.33	1479.
75	7.37	32.55	75	25.47	253.4	1.92	.73	1478.
100	5.82	32.76	99	25.83	218.8	2.54	1.28	1473.
125	5.69	33.37	124	20.33	172.0	3.02	1.84	1474.
150	5.64	33.65	149	20.55	150.7	3.42	2.40	1474.
175	5.39	33.69	174	20.62	145.1	3.79	3.00	1474.
200	5.11	33.70	199	20.66	141.4	4.15	3.69	1473.
225	4.87	33.70	223	20.68	139.0	4.50	4.45	1472.
250	4.66	33.69	248	20.70	137.7	4.84	5.28	1472.
300	4.18	33.69	298	26.75	133.0	5.52	7.18	1471.
400	3.84	33.79	397	26.86	122.7	6.80	11.73	1471.
500	3.66	33.90	496	26.97	113.2	7.98	17.13	1472.
600	3.47	33.99	595	27.06	105.2	9.07	23.24	1473.
800	3.11	34.15	793	27.22	91.0	11.03	37.16	1475.
1000	2.77	34.28	990	27.35	79.3	12.72	52.70	1477.
1200	2.44	34.38	1188	27.46	68.9	14.20	69.25	1479.



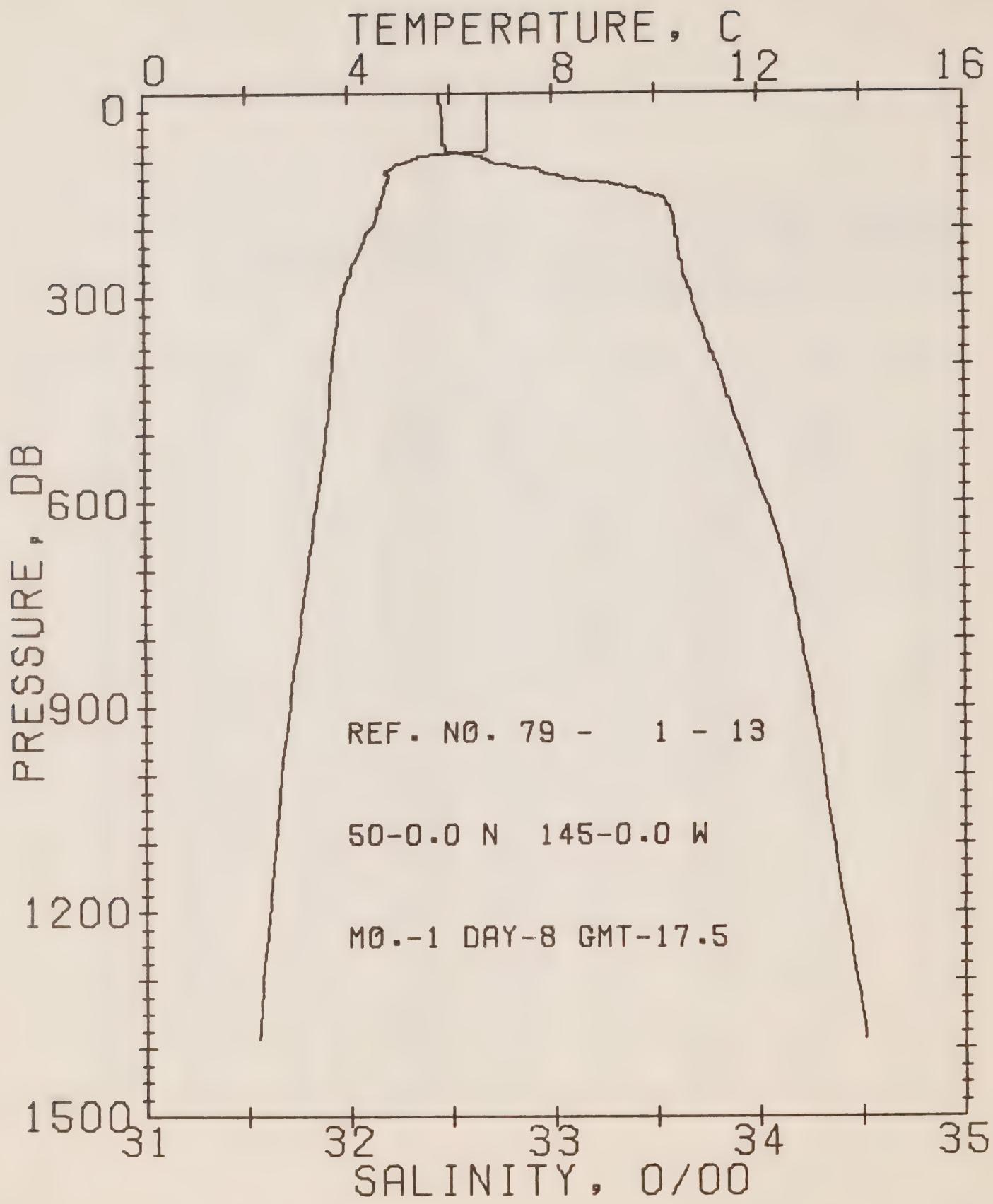
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 13 DATE 8/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.5 STATION P

RESULTS OF STP CAST 163 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.75	32.45	0	25.47	252.0	.00	.00	1475.
10	5.75	32.45	10	25.47	252.1	.25	.01	1475.
20	6.75	32.46	20	25.48	251.5	.50	.05	1475.
30	6.76	32.46	30	25.48	251.7	.76	.12	1475.
40	6.76	32.47	40	25.48	251.1	1.01	.21	1475.
50	6.76	32.47	50	25.48	251.2	1.26	.32	1476.
60	6.76	32.47	60	25.48	251.4	1.51	.46	1476.
70	6.76	32.47	70	25.48	251.5	1.76	.63	1476.
80	6.75	32.48	80	25.49	250.8	2.01	.82	1476.
90	5.81	32.58	89	25.69	232.0	2.26	1.03	1473.
100	5.18	32.69	99	25.85	216.8	2.48	1.25	1470.
110	4.87	32.84	109	26.00	202.3	2.69	1.47	1469.
120	4.81	32.99	119	26.13	190.5	2.88	1.70	1469.
130	4.78	33.20	129	26.30	174.5	3.07	1.93	1470.
140	4.71	33.41	139	26.47	158.1	3.23	2.16	1470.
150	4.70	33.48	149	26.53	152.9	3.39	2.39	1470.
160	4.65	33.55	159	26.59	147.3	3.54	2.63	1470.
170	4.59	33.57	169	26.61	144.8	3.68	2.87	1470.
180	4.56	33.59	179	26.63	143.5	3.83	3.13	1470.
190	4.52	33.59	189	26.63	143.1	3.97	3.40	1470.
200	4.43	33.60	199	26.65	141.5	4.11	3.68	1470.
210	4.34	33.60	209	26.66	140.6	4.25	3.98	1470.
220	4.30	33.61	218	26.67	139.5	4.39	4.28	1470.
230	4.24	33.61	228	26.68	139.0	4.53	4.60	1470.
240	4.17	33.62	238	26.69	137.6	4.67	4.93	1470.
250	4.08	33.63	248	26.71	136.1	4.81	5.28	1469.
260	4.05	33.63	258	26.72	135.7	4.94	5.63	1469.
270	4.00	33.64	268	26.73	134.6	5.08	6.00	1469.
280	3.95	33.65	278	26.74	133.3	5.21	6.37	1469.
290	3.92	33.67	288	26.76	132.0	5.35	6.76	1469.
300	3.87	33.68	298	26.77	130.8	5.48	7.15	1469.



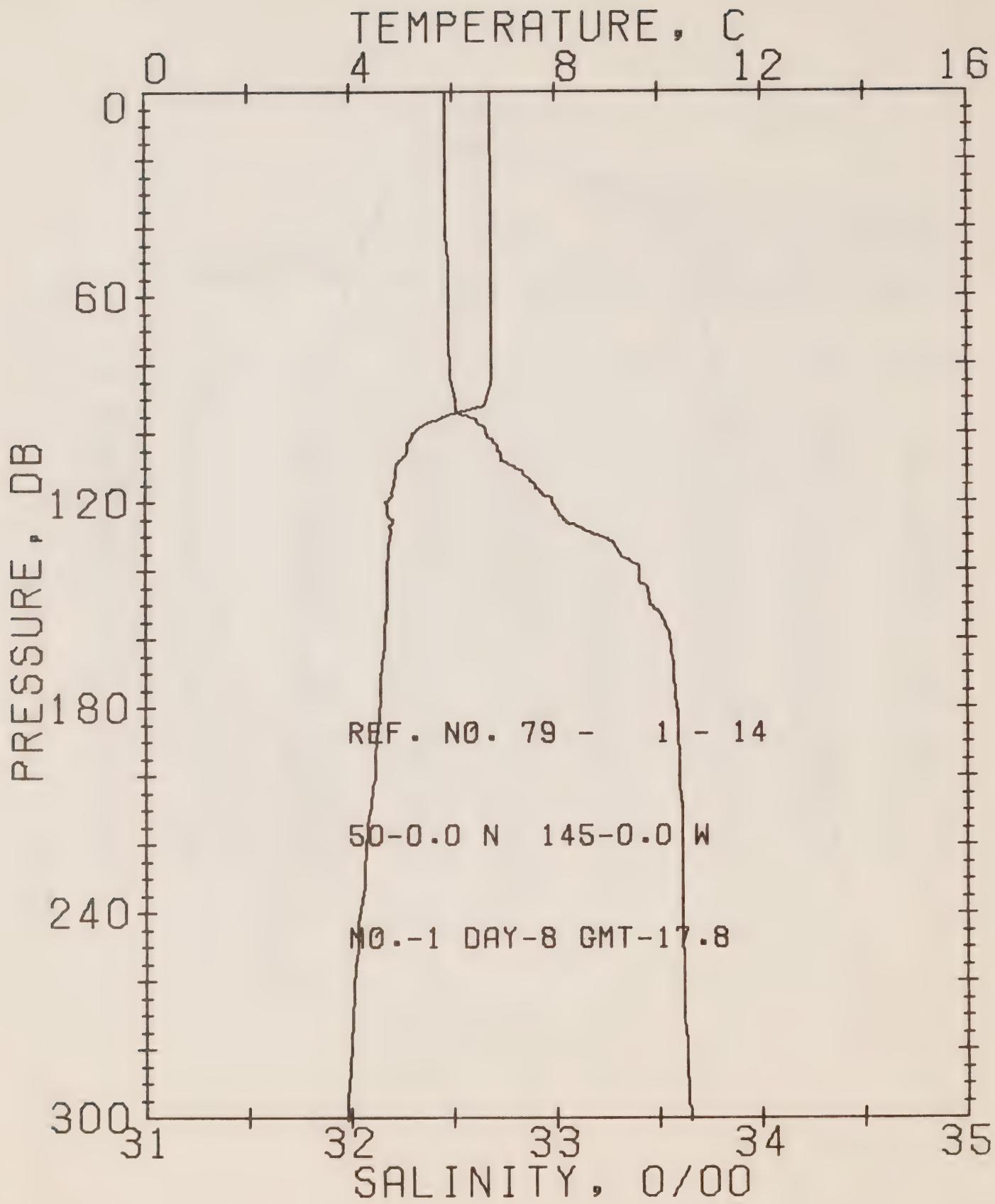
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 13 DATE 8/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.5 STATION P

RESULTS OF STP CAST 175 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.75	32.45	0	25.47	252.0	.00	.00	1475.
10	6.75	32.45	10	25.47	252.1	.25	.01	1475.
20	6.75	32.46	20	25.48	251.5	.50	.05	1475.
30	6.76	32.46	30	25.48	251.7	.76	.12	1475.
50	6.76	32.47	50	25.48	251.2	1.26	.32	1476.
75	6.76	32.47	75	25.48	251.6	1.89	.72	1476.
100	5.18	32.69	99	25.85	216.8	2.48	1.25	1470.
125	4.81	33.06	124	26.18	185.3	2.98	1.81	1470.
150	4.70	33.48	149	26.53	152.9	3.39	2.39	1470.
175	4.58	33.58	174	26.62	144.2	3.76	3.00	1470.
200	4.43	33.60	199	26.65	141.5	4.11	3.68	1470.
225	4.26	33.61	223	26.68	139.1	4.46	4.44	1470.
250	4.08	33.63	248	26.71	136.1	4.81	5.28	1469.
300	3.87	33.68	298	26.77	130.8	5.48	7.15	1469.
400	3.67	33.86	397	26.89	120.4	6.74	11.63	1470.
500	3.54	33.92	496	26.99	110.9	7.89	16.93	1472.
600	3.36	34.03	595	27.10	101.0	8.95	22.87	1473.
300	3.01	34.20	793	27.27	96.2	10.81	36.05	1475.
1000	2.65	34.32	990	27.39	74.9	12.41	50.72	1477.
1200	2.40	34.42	1138	27.49	66.0	13.82	66.53	1479.



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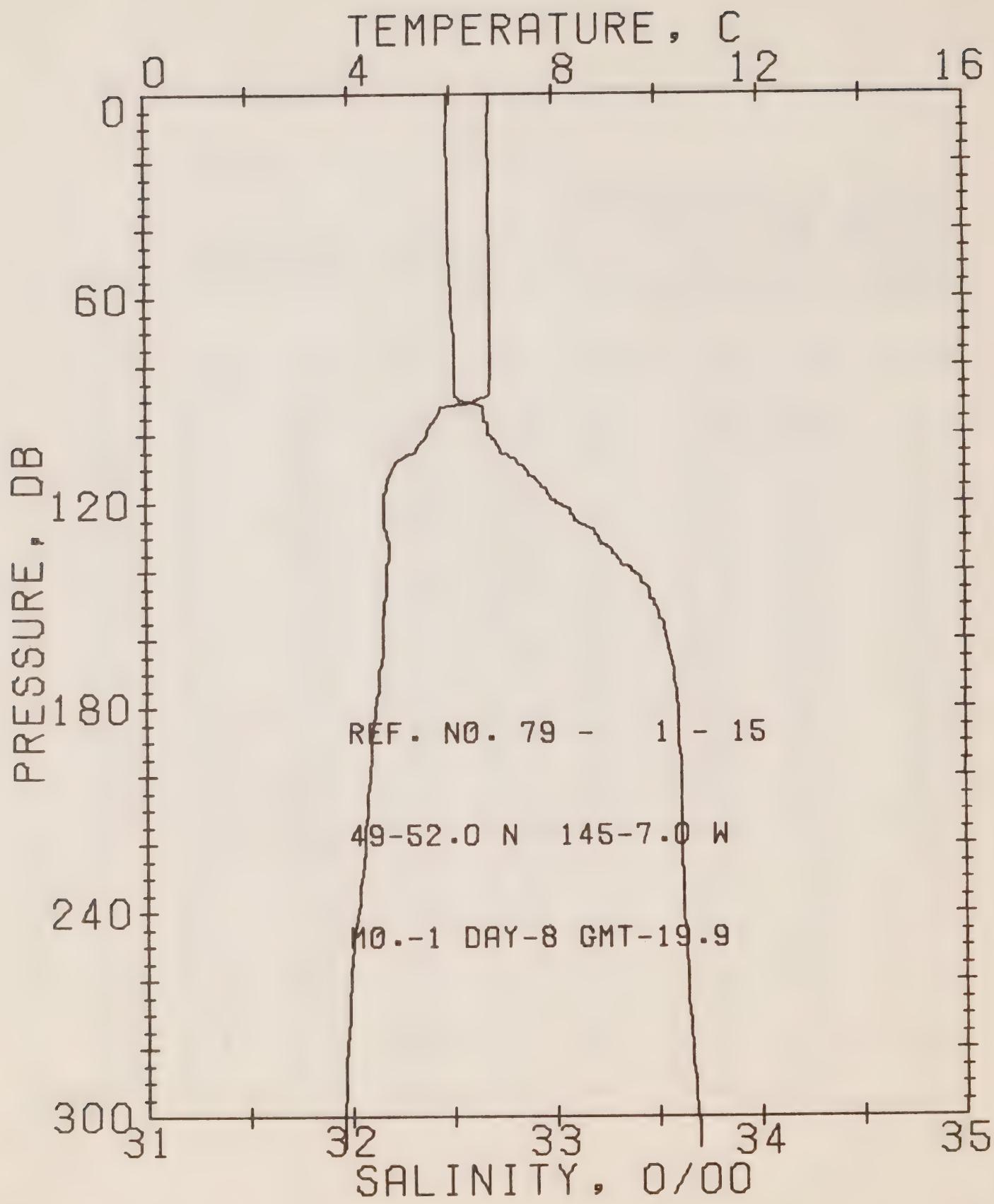
REFERENCE NO. 79- 1- 14 DATE 8/ 1/79

POSITION 50- .0N, 145- .0W GM1 17.8 STATION P

RESULTS OF STP CAST 108 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.76	32.47	0	25.48	250.6	.00	.00	1475.
10	6.76	32.47	10	25.48	250.7	.25	.01	1475.
20	6.77	32.47	20	25.48	251.0	.50	.05	1475.
30	6.77	32.47	30	25.48	251.1	.75	.12	1475.
40	6.77	32.47	40	25.48	251.2	1.00	.20	1475.
50	6.77	32.48	50	25.49	250.6	1.25	.32	1476.
60	6.77	32.48	60	25.49	250.7	1.51	.46	1476.
70	6.78	32.48	70	25.49	251.0	1.76	.63	1476.
80	6.78	32.49	80	25.50	250.5	2.01	.82	1476.
90	6.65	32.51	89	25.53	247.6	2.26	1.03	1476.
100	5.22	32.60	99	25.82	219.4	2.49	1.26	1470.
110	4.88	32.81	109	25.98	204.6	2.70	1.49	1469.
120	4.70	32.98	119	26.13	190.0	2.90	1.72	1469.
130	4.77	33.22	129	26.31	172.9	3.09	1.96	1470.
140	4.72	33.41	139	26.47	158.2	3.25	2.18	1470.
150	4.71	33.46	149	26.51	154.5	3.41	2.41	1470.
160	4.67	33.55	159	26.59	147.1	3.56	2.65	1470.
170	4.59	33.57	169	26.61	145.1	3.70	2.90	1470.
180	4.57	33.59	179	26.63	143.9	3.85	3.15	1470.
190	4.51	33.59	189	26.64	142.8	3.99	3.42	1470.
200	4.47	33.60	199	26.65	141.9	4.13	3.71	1470.
210	4.37	33.61	209	26.67	140.2	4.27	4.00	1470.
220	4.31	33.61	218	26.67	139.6	4.41	4.31	1470.
230	4.27	33.61	228	26.68	139.3	4.55	4.63	1470.
240	4.19	33.61	238	26.69	138.5	4.69	4.96	1470.
250	4.14	33.61	248	26.69	138.1	4.83	5.31	1470.
260	4.06	33.62	258	26.71	136.6	4.97	5.66	1470.
270	4.03	33.62	268	26.71	136.4	5.10	6.03	1470.
280	4.00	33.63	278	26.72	135.4	5.24	6.41	1470.
290	3.95	33.64	288	26.73	134.2	5.38	6.80	1470.
300	3.93	33.65	298	26.74	133.3	5.51	7.21	1470.



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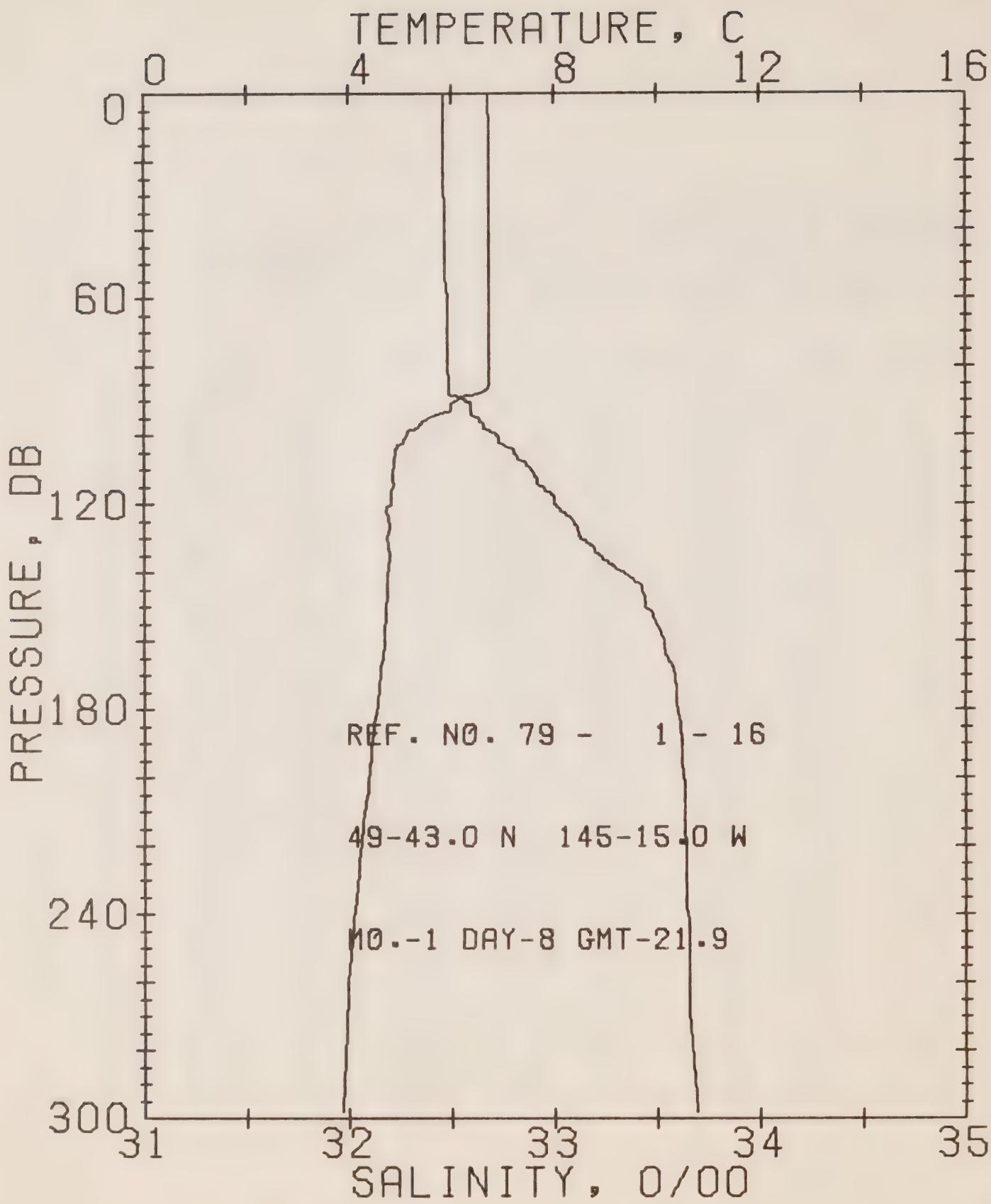
REFERENCE NO. 79- 1- 15 DATE 8/ 1/79

POSITION 49-52.0N, 145- 7.0W GMT 19.9 STATION W3

RESULTS OF STP CAST 123 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED,PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.77	32.49	0	25.50	249.2	.00	.00	1475.
10	6.76	32.48	10	25.49	249.8	.25	.01	1475.
20	6.77	32.49	20	25.50	249.7	.50	.05	1475.
30	6.76	32.49	30	25.50	249.5	.75	.11	1475.
40	6.76	32.49	40	25.50	249.7	1.00	.20	1475.
50	6.77	32.49	50	25.50	249.7	1.25	.32	1476.
60	6.77	32.50	60	25.51	249.3	1.50	.46	1476.
70	6.78	32.51	70	25.51	248.9	1.75	.62	1476.
80	6.77	32.51	80	25.51	248.8	2.00	.81	1476.
90	6.46	32.54	89	25.58	242.8	2.24	1.03	1475.
100	5.52	32.68	99	25.80	221.3	2.47	1.25	1472.
110	4.82	32.88	109	26.02	200.2	2.68	1.47	1469.
120	4.68	33.01	119	26.16	187.6	2.88	1.70	1469.
130	4.74	33.21	129	26.31	173.3	3.06	1.93	1470.
140	4.72	33.38	139	26.45	160.5	3.22	2.16	1470.
150	4.67	33.49	149	26.54	151.8	3.38	2.39	1470.
160	4.64	33.54	159	26.59	147.5	3.53	2.63	1470.
170	4.57	33.50	169	26.62	144.1	3.67	2.87	1470.
180	4.48	33.60	179	26.65	141.8	3.82	3.13	1470.
190	4.41	33.60	189	26.65	141.1	3.96	3.39	1470.
200	4.36	33.61	199	26.67	140.0	4.10	3.67	1470.
210	4.32	33.61	209	26.67	139.6	4.24	3.96	1470.
220	4.26	33.61	218	26.68	139.2	4.38	4.27	1470.
230	4.20	33.62	228	26.69	137.8	4.52	4.59	1470.
240	4.12	33.62	238	26.70	137.0	4.65	4.92	1469.
250	4.02	33.63	248	26.72	135.4	4.79	5.26	1469.
260	3.98	33.64	258	26.73	134.3	4.92	5.61	1469.
270	3.95	33.65	268	26.74	133.5	5.06	5.97	1469.
280	3.89	33.66	278	26.76	132.0	5.19	6.34	1469.
290	3.86	33.67	288	26.77	131.1	5.32	6.72	1469.
300	3.85	33.68	298	26.78	130.0	5.45	7.12	1469.



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REFERENCE NO. 79- 1- 16

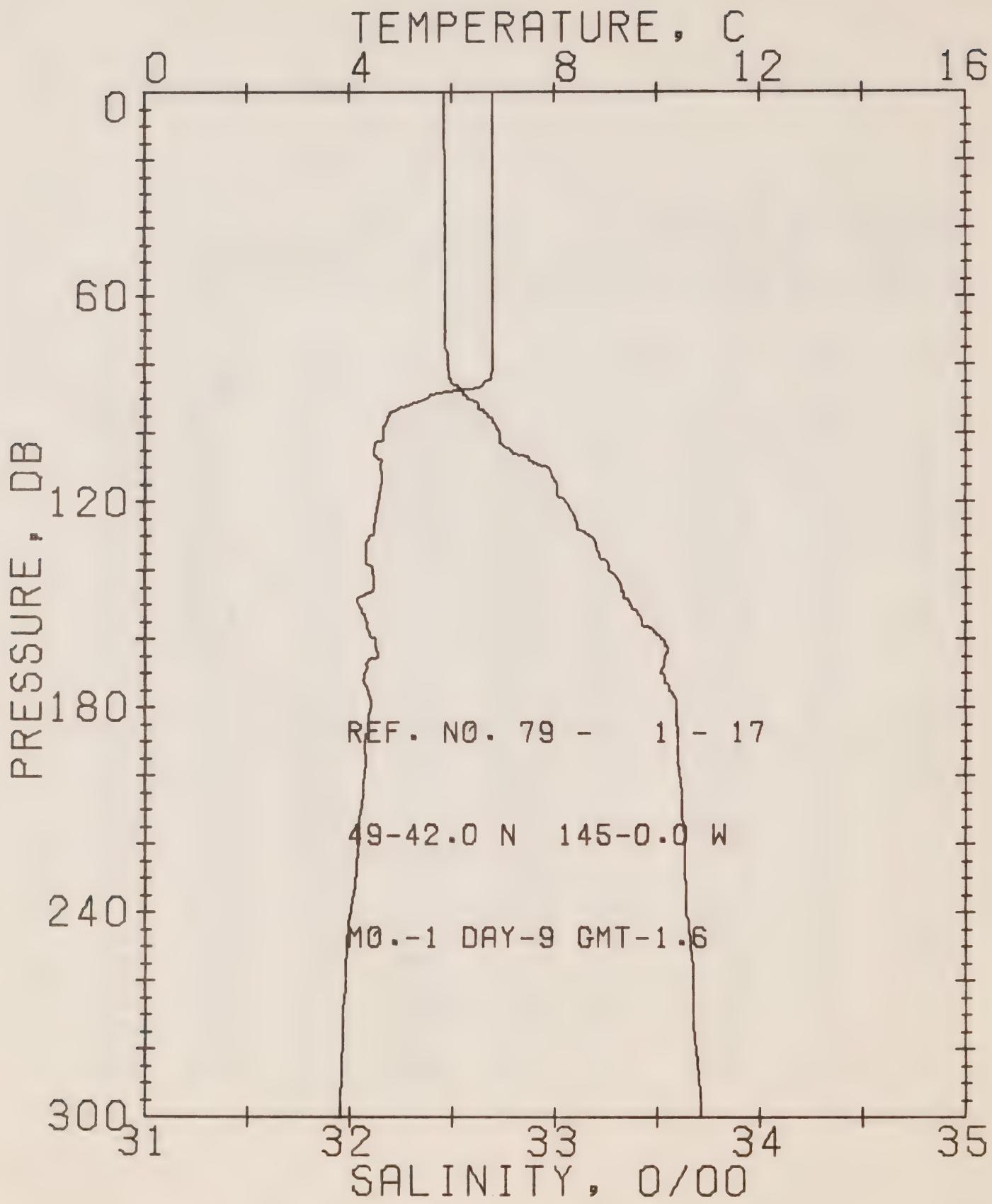
DATE 8/ 1/79

POSITION 49-43.0N, 145-15.0W GMT 21.9 STATION W 4

RESULTS OF STP CAST 119 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.73	32.46	0	25.48	251.0	.00	.00	1475.
10	6.74	32.46	10	25.48	251.2	.25	.01	1475.
20	6.74	32.46	20	25.48	251.4	.50	.05	1475.
30	6.74	32.46	30	25.48	251.1	.75	.12	1475.
40	6.74	32.47	40	25.49	250.9	1.00	.20	1475.
50	6.74	32.47	50	25.49	251.0	1.26	.32	1476.
60	6.75	32.48	60	25.49	250.5	1.51	.46	1476.
70	6.74	32.48	70	25.49	250.5	1.76	.63	1476.
80	6.74	32.48	80	25.49	250.6	2.01	.82	1476.
90	6.07	32.57	89	25.65	235.8	2.26	1.03	1474.
100	5.11	32.72	99	25.88	213.7	2.48	1.25	1470.
110	4.86	32.89	109	26.04	198.4	2.69	1.47	1469.
120	4.83	33.06	119	26.13	189.9	2.88	1.70	1470.
130	4.70	33.13	129	26.24	179.5	3.07	1.93	1470.
140	4.76	33.34	139	26.41	163.9	3.24	2.17	1470.
150	4.73	33.45	149	26.50	155.4	3.40	2.40	1470.
160	4.69	33.53	159	26.57	149.1	3.55	2.64	1470.
170	4.60	33.58	169	26.62	144.2	3.69	2.89	1470.
180	4.54	33.60	179	26.64	142.7	3.84	3.15	1470.
190	4.43	33.62	189	26.67	139.9	3.98	3.41	1470.
200	4.38	33.63	199	26.68	138.9	4.12	3.69	1470.
210	4.30	33.63	209	26.69	137.9	4.26	3.98	1470.
220	4.23	33.64	218	26.70	136.6	4.39	4.28	1470.
230	4.16	33.64	228	26.71	135.9	4.53	4.59	1469.
240	4.09	33.64	238	26.72	134.9	4.67	4.92	1469.
250	4.04	33.65	248	26.73	134.0	4.80	5.25	1469.
260	3.98	33.65	258	26.74	133.5	4.93	5.60	1469.
270	3.96	33.65	268	26.74	133.2	5.07	5.96	1469.
280	3.92	33.67	278	26.76	131.8	5.20	6.33	1469.
290	3.90	33.68	288	26.77	130.6	5.33	6.71	1469.



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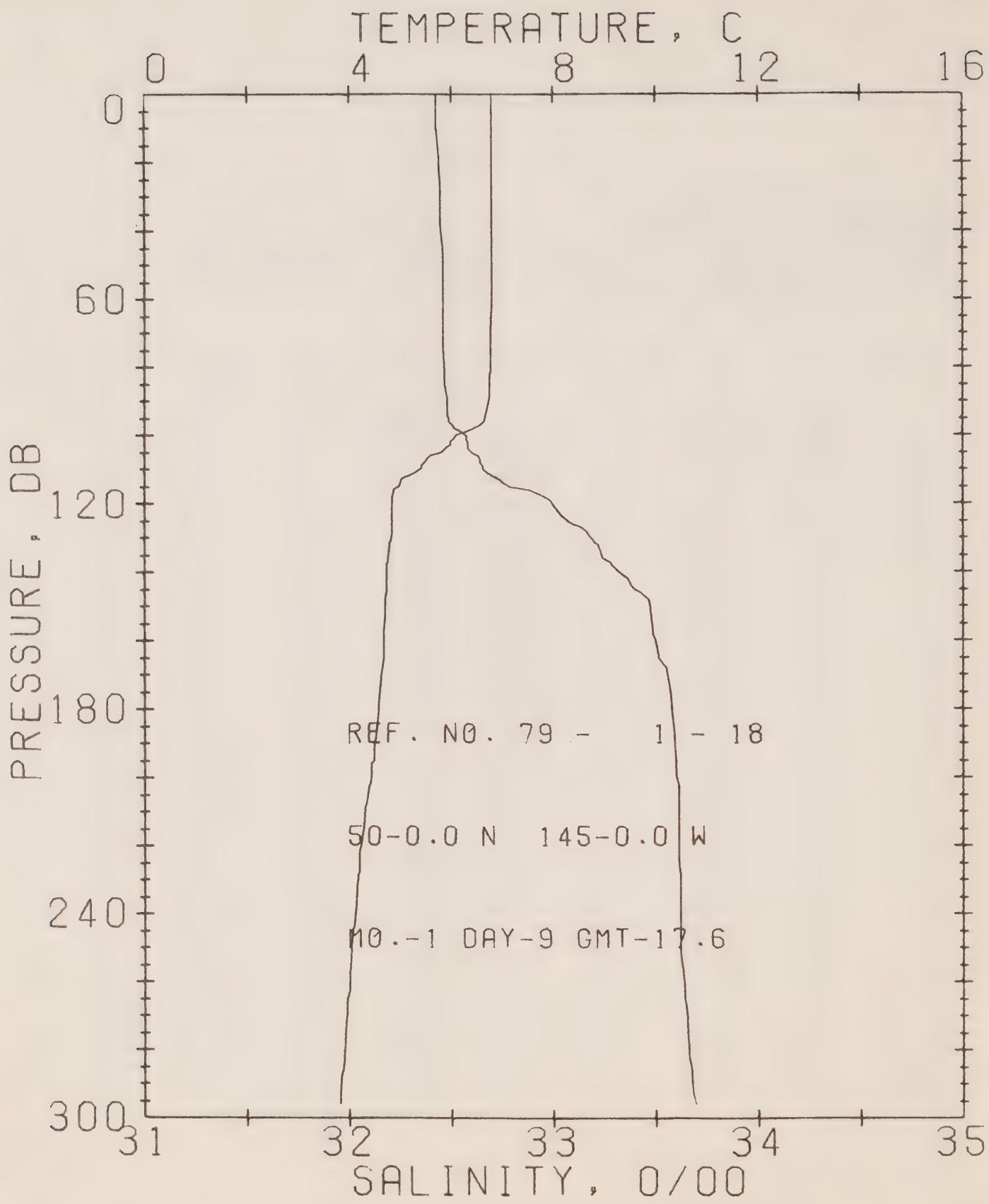
REFERENCE NO. 79-1-17 DATE 9/ 1/79

POSITION 49-42.0N, 145- .0W GMT 1.6 STATION c1

RESULTS OF STP CAST 138 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA F	SVA	DELTA D	POT. EN	SOUND
0	6.80	32.46	0	25.47	251.9	.00	.00	1475.
10	6.80	32.46	10	25.47	252.0	.25	.01	1475.
20	6.80	32.47	20	25.48	251.5	.50	.05	1475.
30	6.81	32.47	30	25.48	251.6	.76	.12	1475.
40	6.81	32.47	40	25.48	251.7	1.01	.21	1476.
50	6.81	32.47	50	25.48	251.9	1.26	.32	1476.
60	6.81	32.47	60	25.48	252.0	1.51	.46	1476.
70	6.81	32.47	70	25.48	252.1	1.76	.63	1476.
80	6.80	32.46	80	25.49	251.4	2.01	.82	1476.
90	5.48	32.58	89	25.73	228.2	2.26	1.03	1471.
100	4.67	32.73	99	25.94	208.3	2.47	1.24	1468.
110	4.61	32.97	109	26.13	189.8	2.68	1.46	1468.
120	4.56	33.05	119	26.20	133.3	2.86	1.68	1469.
130	4.41	33.17	129	26.31	172.9	3.04	1.91	1468.
140	4.45	33.27	139	26.39	165.9	3.21	2.14	1469.
150	4.20	33.37	149	26.49	155.9	3.37	2.37	1468.
160	4.50	33.52	159	26.58	147.8	3.52	2.62	1470.
170	4.29	33.52	169	26.60	145.7	3.67	2.86	1469.
180	4.42	33.59	179	26.65	141.9	3.81	3.12	1470.
190	4.30	33.60	189	26.67	140.0	3.96	3.38	1469.
200	4.29	33.61	199	26.67	139.5	4.10	3.66	1469.
210	4.21	33.62	209	26.69	137.7	4.23	3.95	1469.
220	4.17	33.63	218	26.70	136.7	4.37	4.25	1469.
230	4.11	33.63	228	26.71	136.1	4.51	4.56	1469.
240	4.02	33.64	238	26.73	134.5	4.64	4.89	1469.
250	3.95	33.66	248	26.75	132.4	4.78	5.22	1469.
260	3.92	33.67	258	26.76	131.5	4.91	5.56	1469.
270	3.88	33.67	268	26.76	131.1	5.04	5.92	1469.
280	3.86	33.68	278	26.78	129.9	5.17	6.28	1469.
290	3.83	33.70	288	26.79	128.7	5.30	6.66	1469.
300	3.81	33.71	298	26.80	127.6	5.43	7.04	1469.



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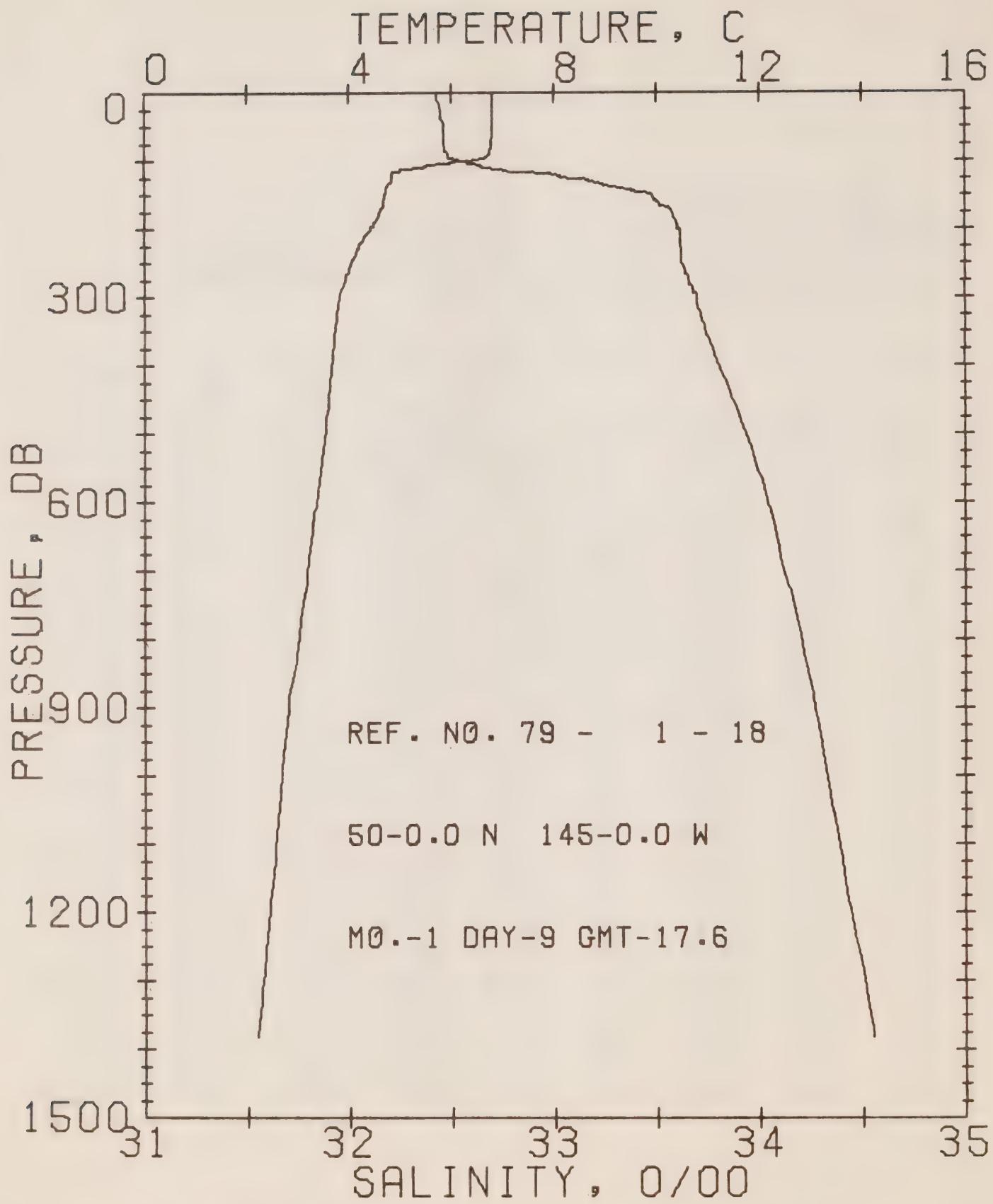
REFERENCE NO. 79- 1- 18 DATE 9/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.6 STATION P

RESULTS OF STP CAST 105 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.79	32.43	0	25.45	254.0	.00	.00	1475.
10	6.79	32.43	10	25.45	254.1	.25	.01	1475.
20	6.79	32.44	20	25.46	253.5	.51	.05	1475.
30	6.79	32.45	30	25.46	252.9	.76	.12	1475.
40	6.79	32.45	40	25.47	252.8	1.01	.21	1476.
50	6.79	32.46	50	25.47	252.4	1.27	.32	1476.
60	6.79	32.46	60	25.47	252.5	1.52	.46	1476.
70	6.77	32.46	70	25.47	252.4	1.77	.63	1476.
80	6.77	32.47	80	25.48	251.8	2.02	.82	1476.
90	6.74	32.48	89	25.50	250.7	2.27	1.04	1476.
100	6.07	32.57	99	25.65	235.9	2.52	1.28	1474.
110	5.39	32.65	109	25.79	222.2	2.75	1.53	1471.
120	4.84	32.99	119	26.13	190.5	2.96	1.77	1470.
130	4.81	33.18	129	26.28	175.9	3.14	2.00	1470.
140	4.73	33.32	139	26.40	165.1	3.31	2.24	1470.
150	4.70	33.47	149	26.52	153.3	3.47	2.47	1470.
160	4.68	33.50	159	26.55	151.2	3.62	2.71	1470.
170	4.62	33.56	169	26.60	146.4	3.77	2.96	1470.
180	4.56	33.58	179	26.62	144.3	3.92	3.22	1470.
190	4.49	33.59	189	26.64	142.8	4.06	3.49	1470.
200	4.43	33.60	199	26.65	141.5	4.20	3.77	1470.
210	4.29	33.61	209	26.67	139.4	4.34	4.07	1470.
220	4.22	33.61	218	26.68	138.7	4.48	4.37	1469.
230	4.15	33.62	228	26.70	137.3	4.62	4.69	1469.
240	4.11	33.62	238	26.70	137.0	4.76	5.02	1469.
250	4.03	33.62	248	26.71	136.2	4.89	5.36	1469.
260	4.00	33.63	258	26.72	134.9	5.03	5.71	1469.
270	3.94	33.65	268	26.74	133.2	5.16	6.07	1469.
280	3.89	33.66	278	26.75	132.2	5.30	6.44	1469.
290	3.84	33.67	288	26.77	130.4	5.43	6.83	1469.
300	3.80	33.69	298	26.79	129.1	5.56	7.21	1469.



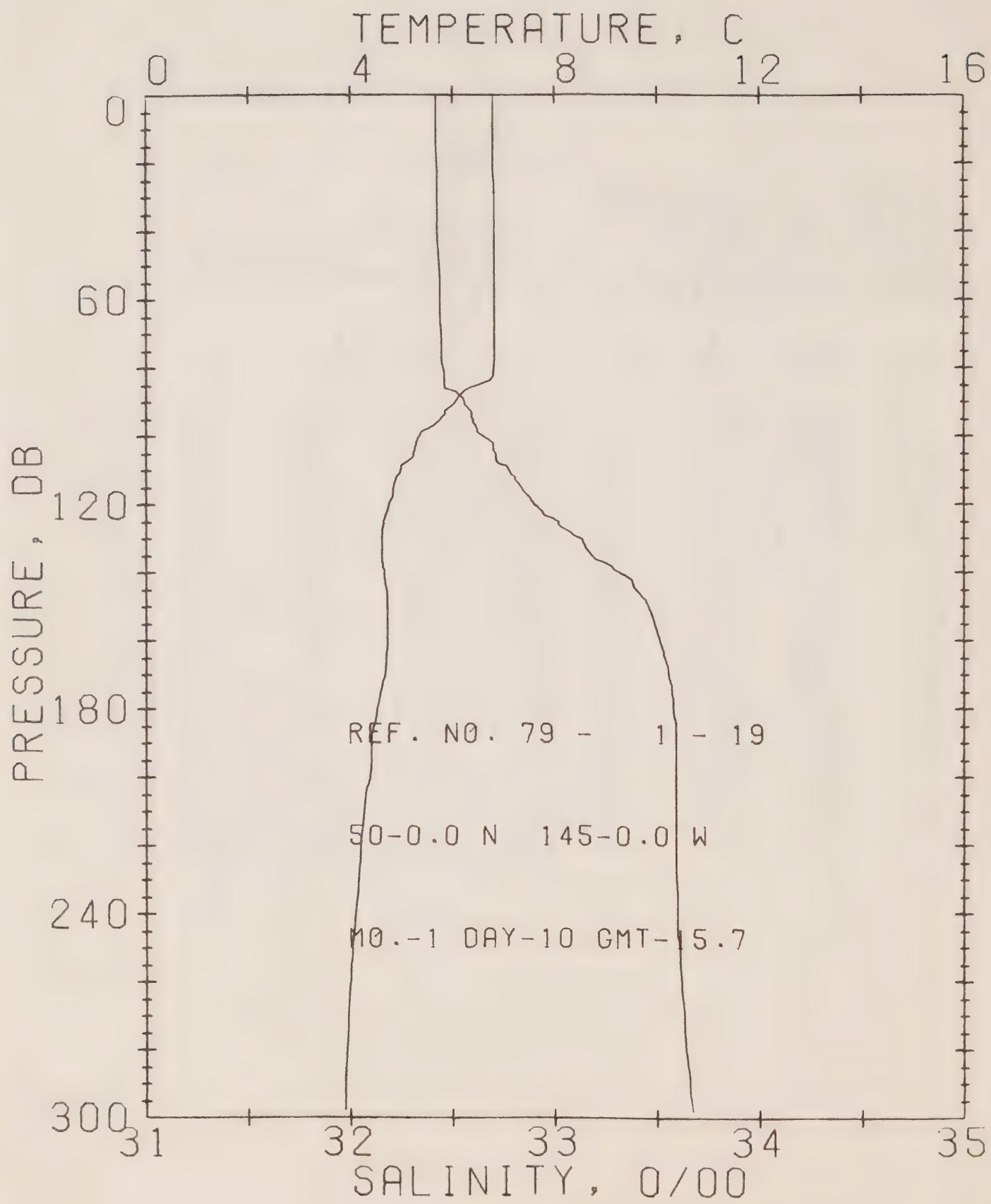
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 18 DATE 9/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.6 STATION P

RESULTS OF STP CAST 102 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.79	32.43	0	25.45	254.0	.00	.00	1475.
10	6.79	32.43	10	25.45	254.1	.25	.01	1475.
20	6.79	32.44	20	25.46	253.5	.51	.05	1475.
30	6.79	32.45	30	25.46	252.9	.76	.12	1475.
50	6.79	32.46	50	25.47	252.4	1.27	.32	1476.
75	6.77	32.46	75	25.48	252.3	1.90	.72	1476.
100	6.07	32.57	99	25.65	235.9	2.52	1.28	1474.
125	4.82	33.07	124	26.19	184.6	3.05	1.88	1470.
150	4.70	33.47	149	26.52	153.3	3.47	2.47	1470.
175	4.59	33.57	174	26.61	145.2	3.84	3.09	1470.
200	4.43	33.60	199	26.65	141.5	4.20	3.77	1470.
225	4.20	33.61	223	26.68	138.5	4.55	4.53	1469.
250	4.03	33.62	248	26.71	136.2	4.89	5.36	1469.
300	3.80	33.69	298	26.79	129.1	5.56	7.21	1469.
400	3.66	33.80	397	26.89	120.0	6.81	11.67	1470.
500	3.53	33.93	496	27.01	109.7	7.95	16.92	1472.
600	3.36	34.04	595	27.11	100.8	9.01	22.81	1473.
800	2.99	34.20	793	27.27	86.0	10.87	36.07	1475.
1000	2.66	34.33	990	27.40	74.5	12.47	50.69	1477.
1200	2.41	34.44	1168	27.51	64.2	13.86	66.20	1479.



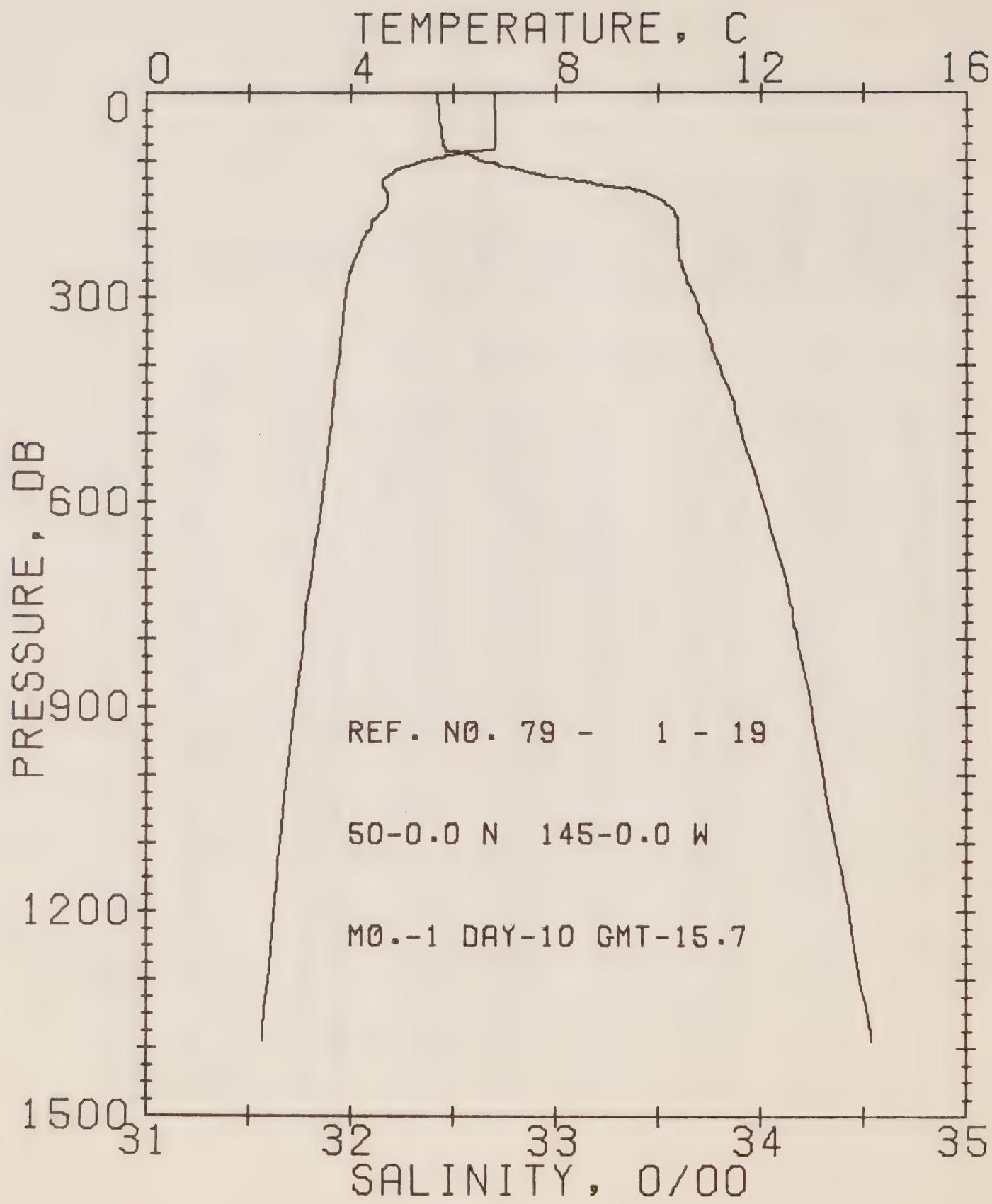
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 19 DATE 10/ 1/79

POSITION 50- .0N, 145- .0W GMT 15.7 STATION P

RESULTS OF STP CAST 111 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.81	32.42	0	25.44	255.0	.00	.00	1475.
10	6.81	32.42	10	25.44	255.1	.26	.01	1475.
20	6.81	32.43	20	25.44	254.7	.51	.05	1475.
30	6.82	32.43	30	25.44	254.7	.76	.12	1475.
40	6.82	32.43	40	25.44	254.9	1.02	.21	1476.
50	6.82	32.44	50	25.45	254.4	1.27	.32	1476.
60	6.82	32.44	60	25.45	254.4	1.53	.47	1476.
70	6.82	32.45	70	25.46	254.0	1.78	.64	1476.
80	6.81	32.46	80	25.47	253.3	2.04	.83	1476.
90	6.06	32.55	89	25.64	236.8	2.28	1.04	1474.
100	5.35	32.65	99	25.80	221.6	2.51	1.27	1471.
110	4.97	32.78	109	25.94	207.8	2.73	1.50	1470.
120	4.76	32.90	119	26.06	196.7	2.93	1.73	1469.
130	4.61	33.13	129	26.26	177.9	3.12	1.97	1469.
140	4.67	33.32	139	26.40	154.4	3.29	2.21	1470.
150	4.71	33.46	149	26.51	154.3	3.45	2.44	1470.
160	4.72	33.51	159	26.55	150.6	3.60	2.69	1470.
170	4.67	33.56	169	26.59	146.9	3.75	2.94	1470.
180	4.52	33.58	179	26.63	143.7	3.90	3.19	1470.
190	4.41	33.59	189	26.65	141.9	4.04	3.46	1470.
200	4.37	33.59	199	26.65	141.6	4.18	3.74	1470.
210	4.26	33.59	209	26.66	140.5	4.32	4.04	1469.
220	4.19	33.59	218	26.67	139.9	4.46	4.35	1469.
230	4.15	33.59	228	26.68	139.2	4.60	4.67	1469.
240	4.08	33.60	238	26.69	138.2	4.74	5.00	1469.
250	4.02	33.61	248	26.70	136.9	4.88	5.34	1469.
260	4.00	33.62	258	26.71	136.0	5.01	5.70	1469.
270	3.96	33.63	268	26.72	134.9	5.15	6.06	1469.
280	3.91	33.64	278	26.74	133.7	5.28	6.44	1469.
290	3.89	33.66	268	26.76	132.2	5.42	6.83	1469.
300	3.89	33.67	298	26.77	131.2	5.55	7.22	1470.



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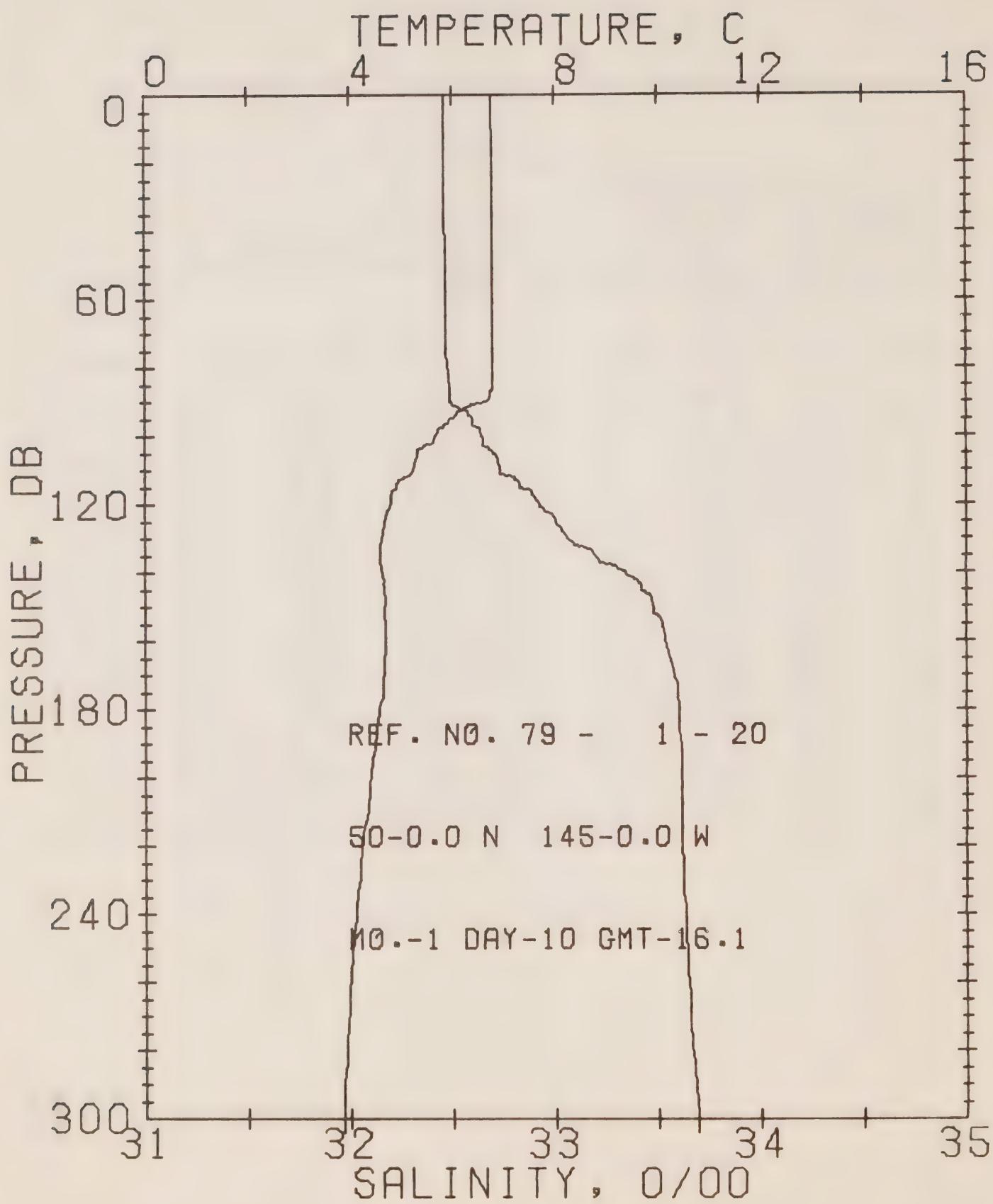
REFERENCE NO. 79- 1- 19 DATE 10/ 1/79

POSITION 50° .0N, 145° .0W GMT 15.7 STATION P

RESULTS OF STP CAST 162 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS.	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.81	32.42	0	25.44	255.0	.00	.00	1475.
10	6.81	32.42	10	25.44	255.1	.26	.01	1475.
20	6.81	32.43	20	25.44	254.7	.51	.05	1475.
30	6.82	32.43	30	25.44	254.7	.76	.12	1475.
50	6.82	32.44	50	25.45	254.4	1.27	.32	1476.
75	6.82	32.45	75	25.46	253.8	1.91	.73	1476.
100	5.35	32.65	99	25.80	221.6	2.51	1.27	1471.
125	4.65	33.02	124	26.17	186.6	3.03	1.85	1469.
150	4.71	33.46	149	26.51	154.3	3.45	2.44	1470.
175	4.59	33.57	174	26.61	145.2	3.82	3.06	1470.
200	4.37	33.59	199	26.65	141.6	4.18	3.74	1470.
225	4.17	33.59	223	26.67	139.7	4.53	4.50	1469.
250	4.02	33.61	248	26.70	136.9	4.88	5.34	1469.
300	3.89	33.67	298	26.77	131.2	5.55	7.22	1470.
400	3.75	33.80	397	26.88	121.4	6.81	11.73	1471.
500	3.59	33.90	496	26.95	112.3	7.98	17.06	1472.
600	3.42	34.01	595	27.08	103.7	9.06	23.11	1473.
800	3.06	34.17	793	27.24	88.7	10.97	36.70	1475.
1000	2.75	34.30	990	27.37	77.1	12.63	51.85	1477.
1200	2.48	34.43	1188	27.50	66.0	14.06	67.86	1479.



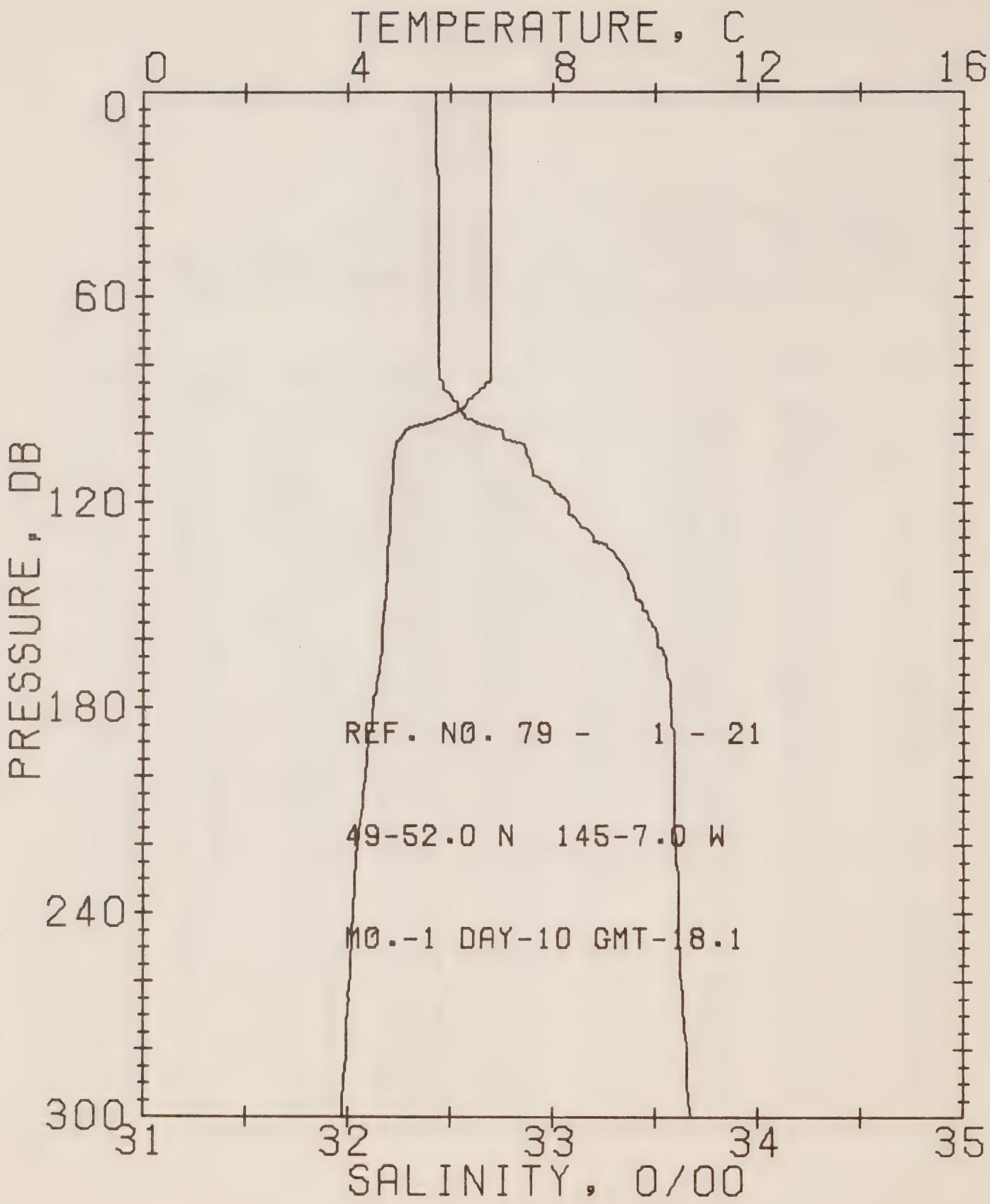
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 20 DATE 10/ 1/79

POSITION 50° .0N, 145° .0W GMT 16.1 STATION P

RESULTS OF STP CAST 121 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.78	32.46	0	25.47	251.6	.00	.00	1475.
10	6.78	32.46	10	25.47	251.8	.25	.01	1475.
20	6.80	32.46	20	25.47	252.1	.50	.05	1475.
30	6.80	32.46	30	25.47	252.2	.76	.12	1475.
40	6.80	32.46	40	25.47	252.1	1.01	.21	1476.
50	6.80	32.47	50	25.48	251.7	1.26	.32	1476.
60	6.80	32.47	60	25.48	251.9	1.51	.46	1476.
70	6.80	32.47	70	25.48	252.0	1.76	.63	1476.
80	6.80	32.48	80	25.48	251.6	2.02	.82	1476.
90	6.64	32.49	90	25.52	248.7	2.27	1.04	1476.
100	5.60	32.64	99	25.76	225.9	2.50	1.27	1472.
110	5.22	32.73	109	25.88	214.3	2.72	1.50	1471.
120	4.78	32.92	119	26.08	195.4	2.92	1.74	1469.
130	4.61	33.06	129	26.21	183.2	3.11	1.98	1469.
140	4.63	33.34	139	26.42	162.5	3.28	2.22	1470.
150	4.68	33.48	149	26.53	152.9	3.44	2.45	1470.
160	4.69	33.53	159	26.57	149.1	3.59	2.69	1470.
170	4.65	33.57	169	26.61	145.4	3.74	2.93	1470.
180	4.56	33.60	179	26.64	142.7	3.88	3.19	1470.
190	4.48	33.61	189	26.65	141.3	4.03	3.46	1470.
200	4.38	33.61	199	26.66	140.2	4.17	3.74	1470.
210	4.33	33.61	209	26.67	139.8	4.31	4.03	1470.
220	4.22	33.61	218	26.66	138.7	4.45	4.34	1470.
230	4.18	33.62	228	26.69	137.6	4.58	4.65	1470.
240	4.11	33.63	238	26.71	136.2	4.72	4.98	1469.
250	4.04	33.64	248	26.72	135.1	4.86	5.32	1469.
260	3.99	33.64	258	26.73	134.1	4.99	5.67	1469.
270	3.97	33.65	268	26.74	133.5	5.12	6.03	1469.
280	3.93	33.66	278	26.75	132.3	5.26	6.40	1469.
290	3.88	33.68	288	26.77	130.7	5.39	6.78	1469.
300	3.86	33.69	298	26.78	129.6	5.52	7.17	1469.



OFFSHORE OCEANOGRAPHY GROUP

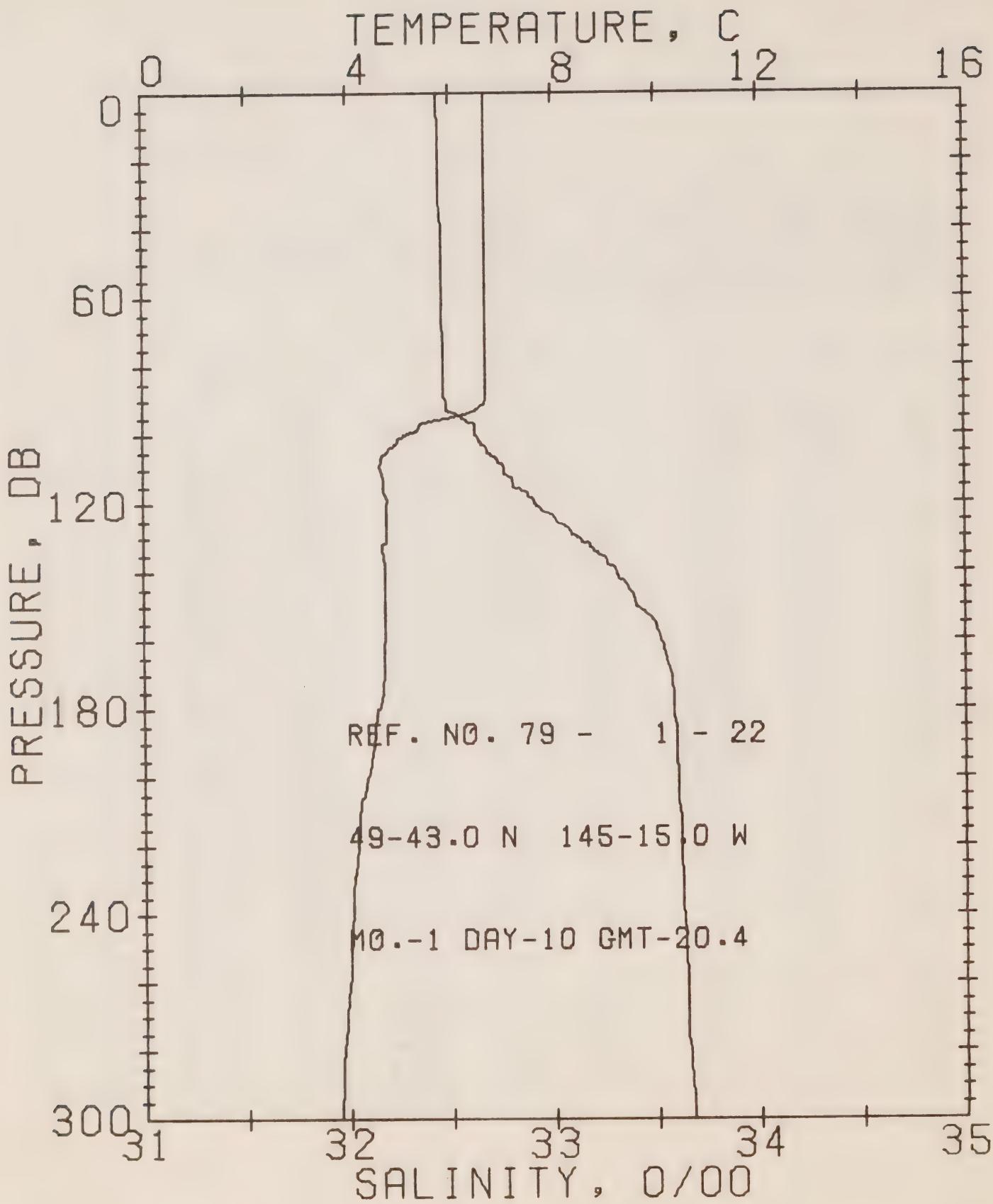
REFERENCE NO. 79- 1- 21 DATE 10/ 1/79

POSITION 49-52.0N, 145- 7.0W GMT 18.1 STATION W3

RESULTS OF STP CAST 124 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.78	32.43	0	25.45	253.9	.00	.00	1475.
10	6.78	32.45	10	25.45	254.0	.25	.01	1475.
20	6.79	32.43	20	25.45	254.2	.51	.05	1475.
30	6.80	32.44	30	25.46	253.7	.76	.12	1475.
40	6.80	32.44	40	25.46	253.9	1.02	.21	1476.
50	6.80	32.44	50	25.46	254.0	1.27	.32	1476.
60	6.80	32.44	60	25.46	254.1	1.52	.47	1476.
70	6.80	32.44	70	25.46	254.2	1.78	.63	1476.
80	6.80	32.44	80	25.46	254.2	2.03	.83	1476.
90	6.36	32.51	89	25.57	243.8	2.28	1.05	1475.
100	5.08	32.75	99	25.91	211.2	2.51	1.27	1470.
110	4.87	32.90	109	26.05	197.8	2.71	1.48	1469.
120	4.83	33.07	119	26.19	184.7	2.91	1.71	1470.
130	4.81	33.20	129	26.29	174.8	3.09	1.94	1470.
140	4.77	33.36	139	26.43	162.5	3.25	2.17	1470.
150	4.71	33.44	149	26.50	156.0	3.41	2.41	1470.
160	4.67	33.51	159	26.55	150.6	3.57	2.65	1470.
170	4.60	33.55	169	26.60	146.4	3.72	2.90	1470.
180	4.50	33.57	179	26.62	143.9	3.86	3.15	1470.
190	4.40	33.59	189	26.65	141.8	4.00	3.42	1470.
200	4.34	33.59	199	26.65	141.3	4.14	3.71	1470.
210	4.27	33.59	209	26.66	140.6	4.29	4.00	1470.
220	4.18	33.60	218	26.68	139.0	4.43	4.31	1469.
230	4.14	33.61	228	26.69	137.9	4.56	4.62	1469.
240	4.11	33.61	238	26.69	137.7	4.70	4.95	1469.
250	4.06	33.61	248	26.70	137.0	4.84	5.30	1469.
260	4.03	33.62	258	26.71	136.1	4.98	5.65	1469.
270	3.99	33.63	268	26.72	134.9	5.11	6.02	1469.
280	3.97	33.65	278	26.74	133.6	5.25	6.39	1469.
290	3.93	33.65	288	26.75	133.1	5.38	6.78	1469.
300	3.89	33.67	298	26.76	131.4	5.51	7.18	1469.



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REFERENCE NO. 79- 1- 22

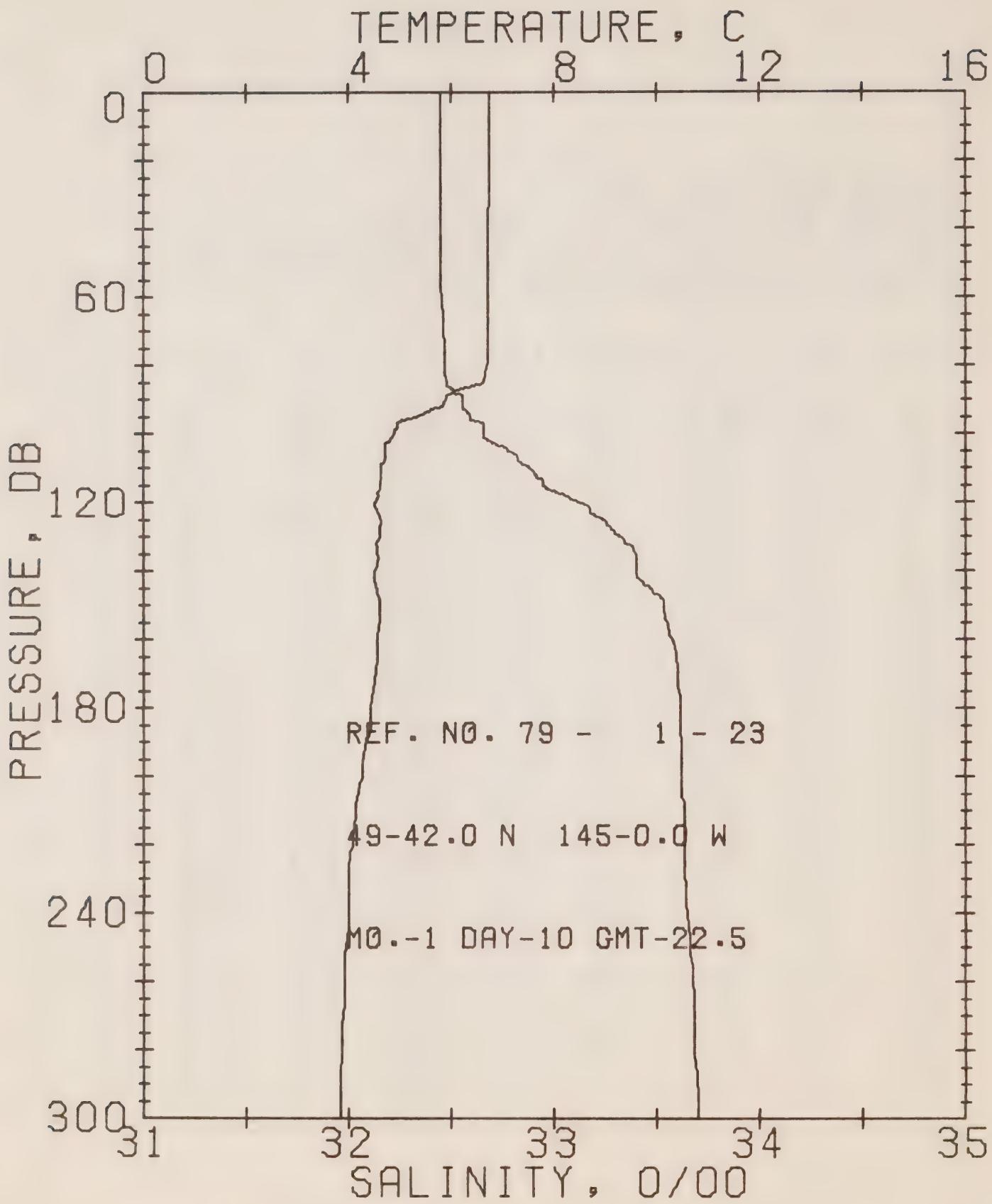
DATE 10/ 1/79

POSITION 49-43.0N, 145-15.0W GMT 20.4 STATION W4

RESULTS OF STP CAST 120 POINTS TAKEN FROM ANALOG TRACE

BUILDLINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.69	32.44	0	25.47	252.0	.00	.00	1474.
10	6.69	32.45	10	25.48	251.4	.25	.01	1475.
20	6.69	32.45	20	25.48	251.5	.50	.05	1475.
30	6.69	32.45	30	25.48	251.6	.75	.12	1475.
40	6.69	32.46	40	25.48	251.1	1.01	.21	1475.
50	6.70	32.46	50	25.48	251.2	1.26	.32	1475.
60	6.70	32.46	60	25.48	251.4	1.51	.46	1476.
70	6.70	32.47	70	25.49	251.1	1.76	.63	1476.
80	6.70	32.47	80	25.49	250.9	2.01	.82	1476.
90	6.68	32.47	89	25.50	250.4	2.26	1.04	1476.
100	5.10	32.62	99	25.80	221.1	2.50	1.26	1470.
110	4.64	32.76	109	25.96	205.8	2.71	1.49	1468.
120	4.75	32.91	119	26.07	195.8	2.91	1.73	1469.
130	4.75	33.12	129	26.24	180.2	3.10	1.97	1470.
140	4.73	33.30	139	26.30	166.1	3.27	2.20	1470.
150	4.72	33.40	149	26.46	159.1	3.43	2.44	1470.
160	4.71	33.52	159	26.56	150.3	3.59	2.69	1470.
170	4.69	33.57	169	26.60	146.6	3.74	2.94	1471.
180	4.55	33.58	179	26.62	144.0	3.88	3.20	1470.
190	4.47	33.59	189	26.64	142.5	4.02	3.47	1470.
200	4.34	33.60	199	26.66	140.5	4.17	3.75	1470.
210	4.21	33.61	209	26.68	138.8	4.31	4.04	1469.
220	4.15	33.61	218	26.69	138.0	4.44	4.34	1469.
230	4.07	33.62	228	26.71	136.5	4.58	4.66	1469.
240	4.04	33.62	238	26.71	136.0	4.72	4.98	1469.
250	4.01	33.63	248	26.72	135.3	4.85	5.32	1469.
260	3.98	33.64	258	26.73	134.3	4.99	5.67	1469.
270	3.92	33.64	268	26.74	133.7	5.12	6.03	1469.
280	3.86	33.65	278	26.75	132.5	5.26	6.41	1469.
290	3.84	33.66	288	26.76	131.5	5.39	6.79	1469.
300	3.82	33.67	298	26.77	130.7	5.52	7.19	1469.



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REFERENCE NO. 79- 1- 23

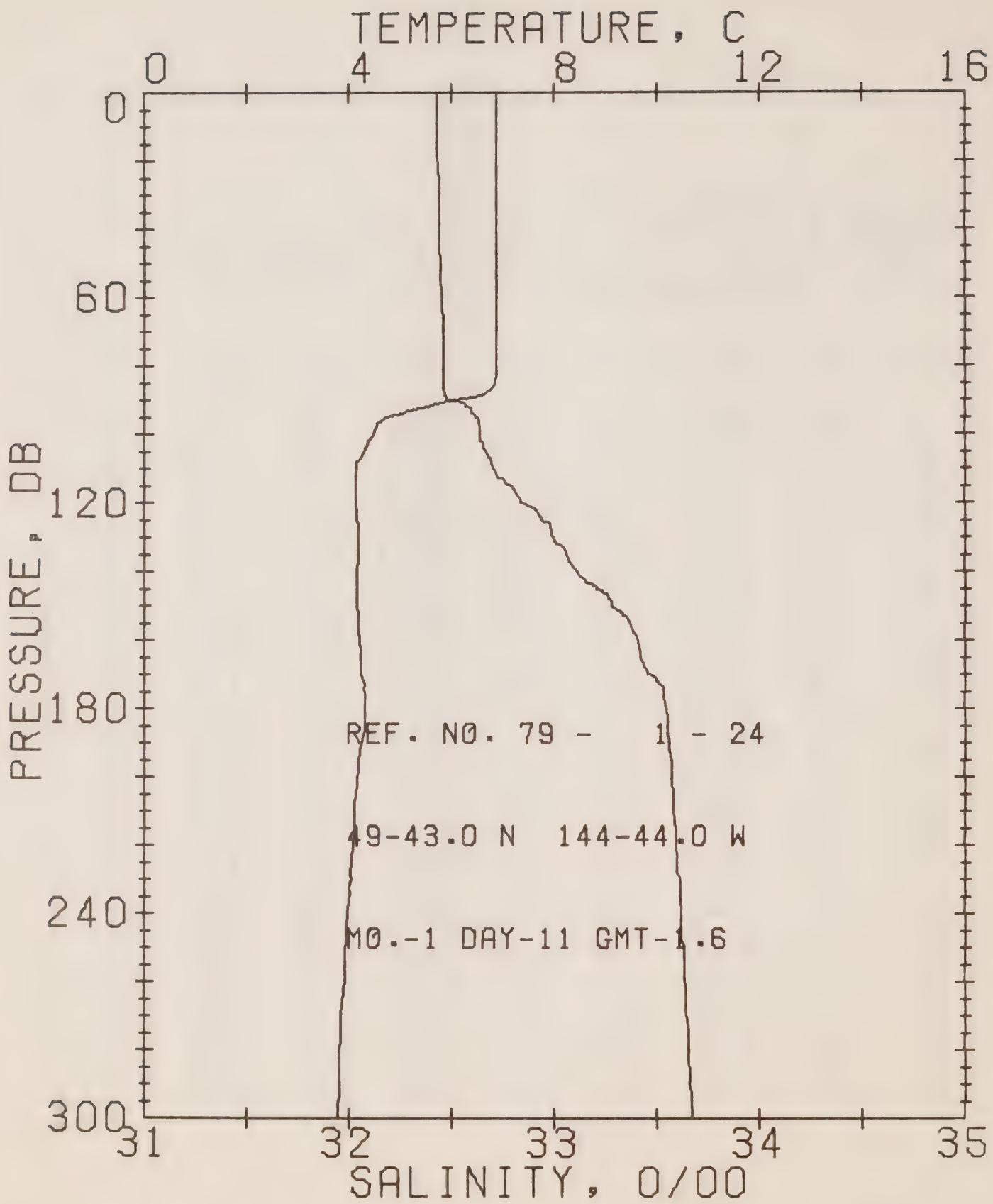
DATE 10/ 1/79

POSITION 49-42.0N, 145- .0W GM1 22.5 STATION C1

RESULTS OF STP CAST 126 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.75	32.45	0	25.47	252.0	.00	.00	1475.
10	6.74	32.45	10	25.47	252.0	.25	.01	1475.
20	6.74	32.45	20	25.47	252.1	.50	.05	1475.
30	6.74	32.45	30	25.47	252.2	.76	.12	1475.
40	6.73	32.45	40	25.47	252.2	1.01	.21	1475.
50	6.73	32.45	50	25.47	252.4	1.26	.32	1475.
60	6.73	32.45	60	25.47	252.2	1.51	.46	1476.
70	6.73	32.46	70	25.48	251.7	1.77	.63	1476.
80	6.71	32.47	80	25.49	251.0	2.02	.82	1476.
90	5.90	32.55	89	25.66	235.2	2.26	1.03	1473.
100	4.88	32.66	99	25.86	215.8	2.49	1.25	1469.
110	4.63	32.88	109	26.06	196.7	2.69	1.47	1468.
120	4.52	33.12	119	26.26	177.7	2.88	1.70	1468.
130	4.60	33.32	129	26.41	163.6	3.05	1.91	1469.
140	4.52	33.40	139	26.48	156.9	3.21	2.13	1469.
150	4.61	33.53	149	26.58	148.1	3.37	2.36	1470.
160	4.55	33.57	159	26.62	144.6	3.51	2.59	1470.
170	4.53	33.60	169	26.64	142.2	3.66	2.83	1470.
180	4.43	33.61	179	26.66	140.5	3.80	3.08	1470.
190	4.33	33.62	189	26.68	138.8	3.94	3.35	1469.
200	4.26	33.62	199	26.69	138.2	4.08	3.62	1469.
210	4.13	33.63	209	26.71	136.2	4.21	3.91	1469.
220	4.07	33.63	218	26.71	135.6	4.35	4.21	1469.
230	4.00	33.63	228	26.72	134.7	4.48	4.51	1469.
240	3.99	33.64	238	26.73	133.9	4.62	4.84	1469.
250	3.95	33.66	248	26.75	132.4	4.75	5.17	1469.
260	3.91	33.67	258	26.76	131.2	4.88	5.51	1469.
270	3.89	33.68	268	26.77	130.4	5.01	5.86	1469.
280	3.86	33.68	278	26.77	130.3	5.14	6.23	1469.
290	3.84	33.69	288	26.79	129.1	5.27	6.61	1469.
300	3.83	33.70	298	26.79	128.6	5.40	6.99	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79-1-24

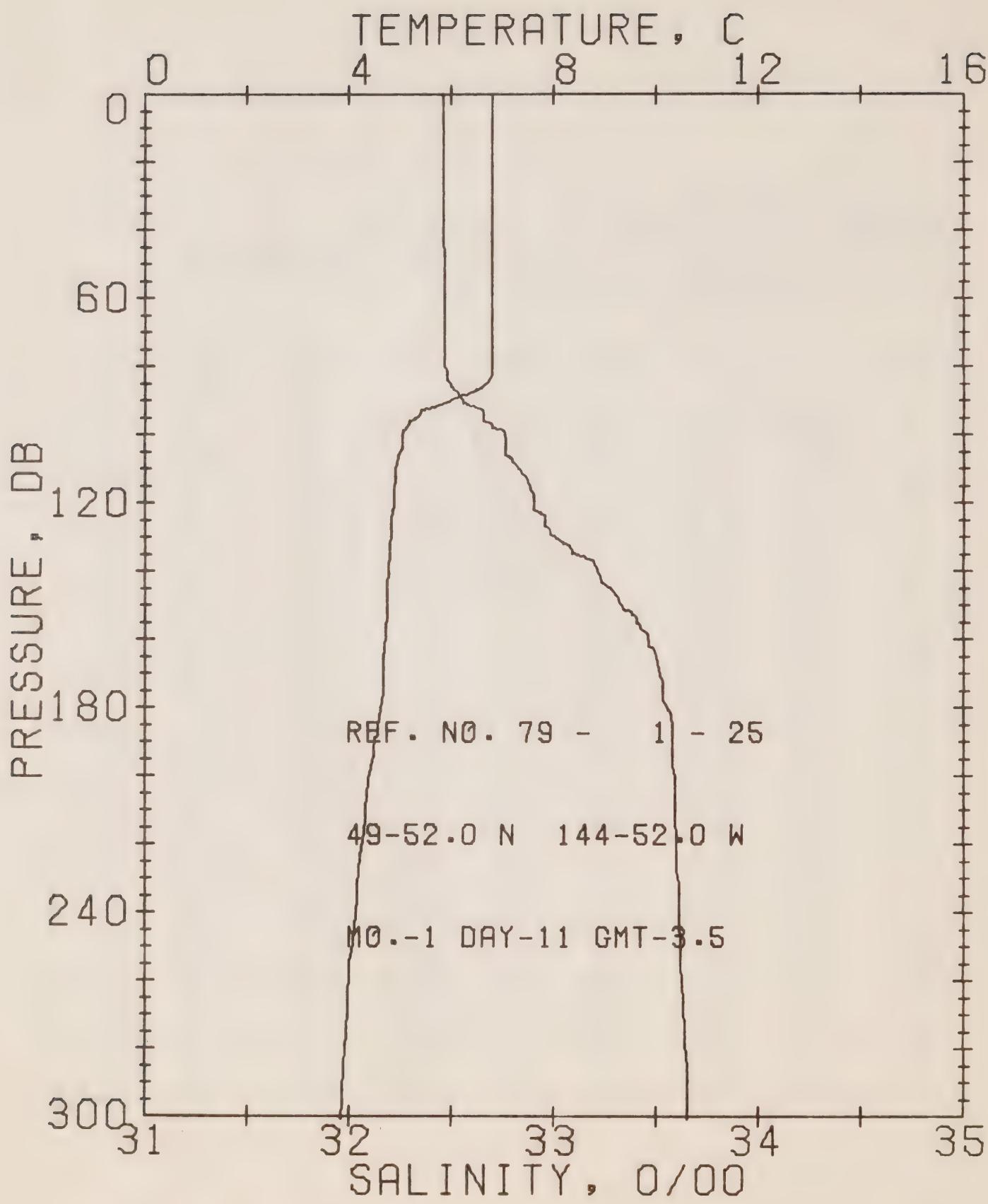
DATE 11/1/79

POSITION 49-43.0N, 144-44.0W GMT 1.6 STATION E4

RESULTS OF STP CAST 118 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.87	32.43	0	25.44	255.0	.00	.00	1475.
10	6.87	32.43	10	25.44	255.1	.26	.01	1475.
20	6.88	32.43	20	25.44	255.2	.51	.05	1476.
30	6.88	32.44	30	25.44	254.7	.77	.12	1476.
40	6.88	32.44	40	25.44	254.9	1.02	.21	1476.
50	6.87	32.45	50	25.45	254.3	1.27	.32	1476.
60	6.87	32.45	60	25.46	253.9	1.53	.47	1476.
70	6.87	32.46	70	25.46	253.6	1.78	.64	1476.
80	6.87	32.46	80	25.46	253.8	2.04	.83	1477.
90	6.06	32.48	89	25.58	242.4	2.29	1.05	1473.
100	4.48	32.64	99	25.89	213.1	2.51	1.26	1467.
110	4.15	32.70	109	25.97	205.4	2.72	1.49	1466.
120	4.14	32.84	119	26.08	194.8	2.92	1.72	1466.
130	4.19	32.99	129	26.20	183.7	3.11	1.96	1467.
140	4.17	33.11	139	26.29	175.3	3.29	2.21	1467.
150	4.15	33.28	149	26.43	162.1	3.45	2.45	1468.
160	4.22	33.40	159	26.52	153.6	3.61	2.70	1468.
170	4.24	33.40	169	26.56	149.7	3.76	2.96	1469.
180	4.32	33.54	179	26.62	144.6	3.91	3.22	1469.
190	4.23	33.56	189	26.64	142.3	4.05	3.49	1469.
200	4.17	33.57	199	26.66	141.0	4.19	3.77	1469.
210	4.10	33.58	209	26.67	139.6	4.33	4.06	1469.
220	4.09	33.59	218	26.68	138.8	4.47	4.37	1469.
230	4.05	33.61	228	26.70	137.0	4.61	4.68	1469.
240	3.98	33.62	238	26.71	135.6	4.75	5.01	1469.
250	3.93	33.63	248	26.73	134.5	4.88	5.35	1469.
260	3.90	33.63	258	26.75	134.0	5.02	5.70	1469.
270	3.85	33.64	268	26.75	132.9	5.15	6.06	1469.
280	3.82	33.65	278	26.75	132.1	5.28	6.43	1469.
290	3.81	33.66	288	26.76	131.2	5.41	6.81	1469.
300	3.80	33.67	298	26.77	130.5	5.54	7.20	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 25

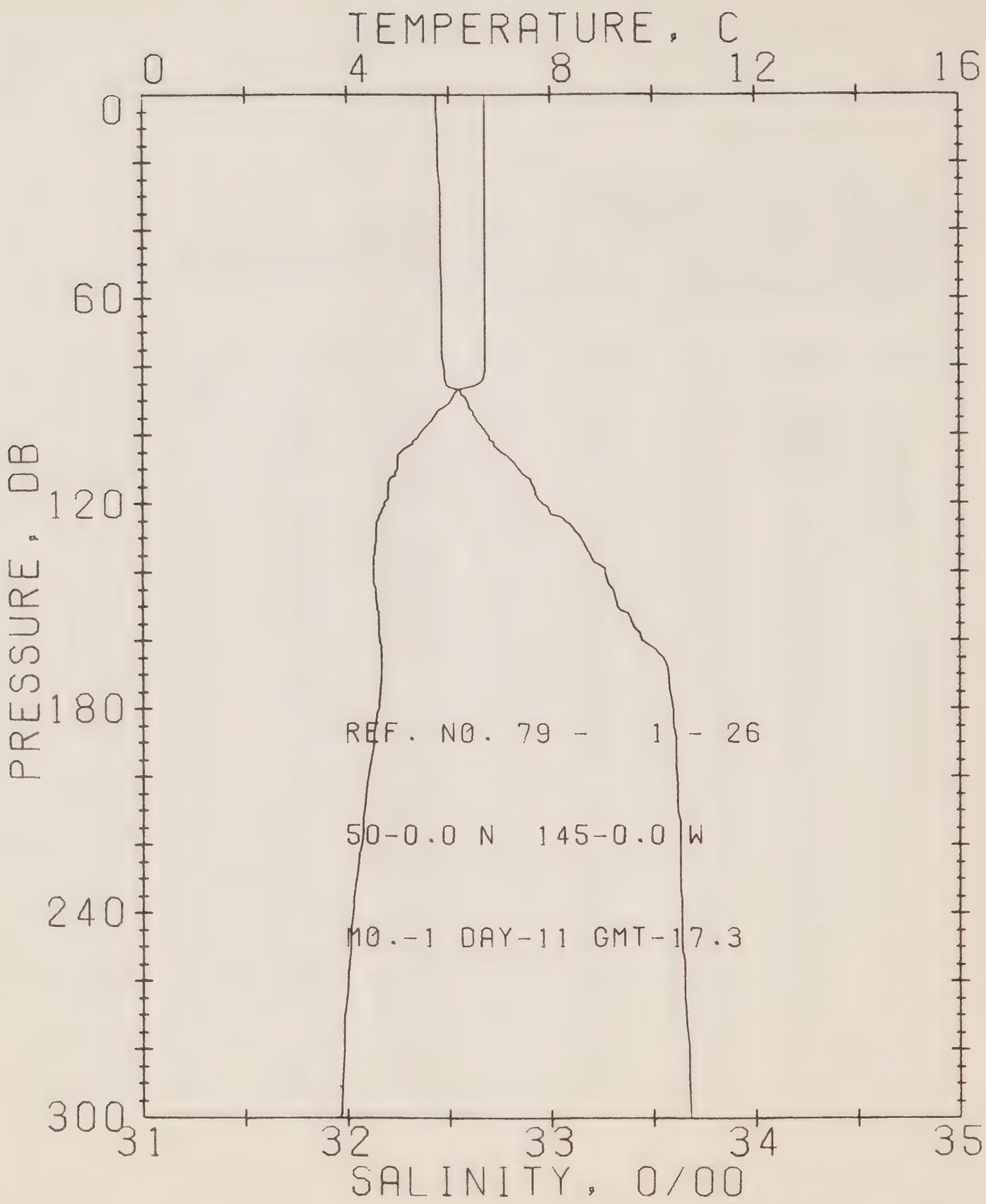
DATE 11/ 1/79

POSITION 49-52.0N, 144-52.0W GMT 3.5 STATION E3

RESULTS OF STP CAST 116 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.80	32.46	0	25.47	251.9	.00	.00	1475.
10	6.81	32.46	10	25.47	252.1	.25	.01	1475.
20	6.81	32.46	20	25.47	252.2	.50	.05	1475.
30	6.81	32.46	30	25.47	252.4	.76	.12	1475.
40	6.81	32.46	40	25.47	252.5	1.01	.21	1476.
50	6.81	32.47	50	25.48	251.9	1.26	.32	1476.
60	6.81	32.47	60	25.48	252.0	1.51	.46	1476.
70	6.81	32.47	70	25.48	252.1	1.77	.63	1476.
80	6.81	32.47	80	25.48	252.2	2.02	.82	1476.
90	6.00	32.55	89	25.64	236.5	2.26	1.04	1473.
100	5.05	32.76	99	25.92	210.1	2.49	1.25	1470.
110	4.92	32.83	109	25.99	203.5	2.69	1.47	1470.
120	4.88	32.91	119	26.06	197.4	2.89	1.71	1470.
130	4.81	33.01	129	26.14	189.1	3.09	1.95	1470.
140	4.77	33.21	139	26.31	173.7	3.27	2.20	1470.
150	4.75	33.33	149	26.40	164.6	3.44	2.45	1470.
160	4.71	33.46	159	26.51	154.3	3.60	2.70	1470.
170	4.67	33.52	169	26.56	150.0	3.75	2.96	1470.
180	4.62	33.55	179	26.59	147.0	3.90	3.22	1470.
190	4.50	33.58	189	26.63	143.6	4.04	3.50	1470.
200	4.39	33.59	199	26.65	141.9	4.18	3.78	1470.
210	4.33	33.59	209	26.65	141.2	4.33	4.08	1470.
220	4.25	33.60	218	26.67	139.7	4.47	4.38	1470.
230	4.18	33.61	228	26.68	138.7	4.61	4.70	1469.
240	4.13	33.61	238	26.69	137.9	4.74	5.03	1469.
250	4.06	33.62	248	26.71	136.6	4.88	5.38	1469.
260	3.99	33.62	258	26.72	135.6	5.02	5.73	1469.
270	3.97	33.63	268	26.73	134.7	5.15	6.10	1469.
280	3.93	33.64	278	26.74	133.8	5.29	6.47	1469.
290	3.89	33.65	288	26.75	132.8	5.42	6.86	1469.
300	3.85	33.65	298	26.75	132.5	5.55	7.26	1469.



OFFSHORE OCEANOGRAPHY GROUP

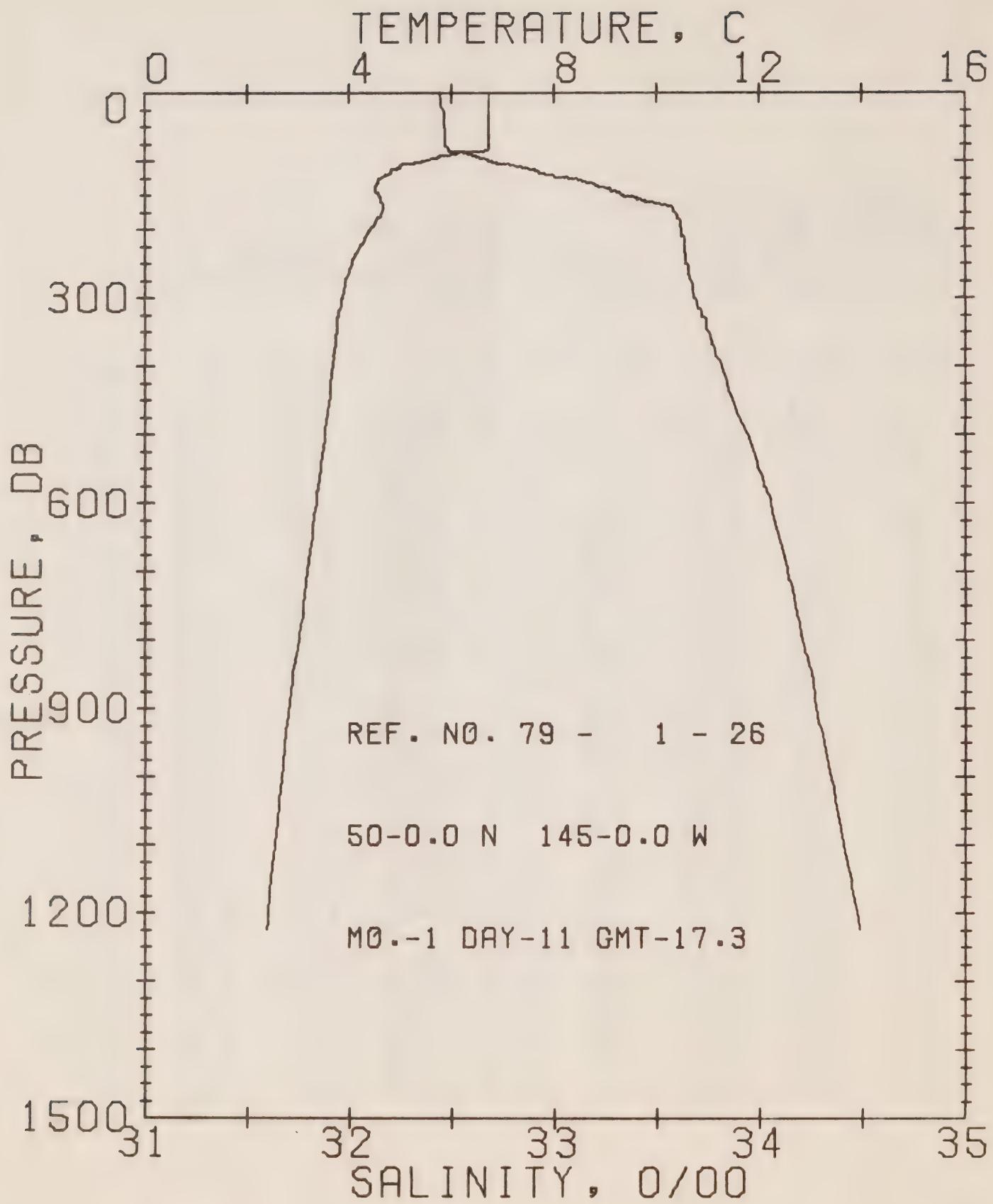
REFERENCE NO. 79- 1- 26 DATE 11/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 110 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.71	32.44	0	25.47	252.2	.00	.00	1475.
10	6.71	32.45	10	25.47	251.8	.25	.01	1475.
20	6.71	32.45	20	25.47	251.7	.50	.05	1475.
30	6.71	32.46	30	25.48	251.1	.76	.12	1475.
40	6.71	32.46	40	25.48	251.2	1.01	.20	1475.
50	6.71	32.46	50	25.48	251.2	1.26	.32	1475.
60	6.71	32.47	60	25.49	250.8	1.51	.46	1476.
70	6.71	32.47	70	25.49	250.9	1.76	.63	1476.
80	6.71	32.48	80	25.50	250.4	2.01	.82	1476.
90	6.04	32.59	89	25.67	234.3	2.25	1.03	1474.
100	5.41	32.69	99	25.82	219.3	2.48	1.25	1471.
110	4.98	32.85	109	26.00	202.7	2.69	1.48	1470.
120	4.72	32.96	119	26.11	191.8	2.89	1.71	1469.
130	4.56	33.15	129	26.28	175.9	3.07	1.94	1469.
140	4.51	33.27	139	26.38	166.5	3.24	2.18	1469.
150	4.58	33.35	149	26.42	162.8	3.41	2.42	1469.
160	4.63	33.45	159	26.51	154.4	3.57	2.67	1470.
170	4.65	33.57	169	26.61	145.6	3.71	2.92	1470.
180	4.61	33.60	179	26.63	143.2	3.86	3.18	1470.
190	4.51	33.61	189	26.65	141.4	4.00	3.44	1470.
200	4.40	33.62	199	26.67	139.9	4.14	3.72	1470.
210	4.31	33.62	209	26.68	138.8	4.28	4.01	1470.
220	4.28	33.63	218	26.69	137.8	4.42	4.32	1470.
230	4.16	33.63	228	26.70	136.7	4.56	4.63	1469.
240	4.10	33.64	238	26.72	135.3	4.69	4.96	1469.
250	4.05	33.64	248	26.72	134.9	4.83	5.29	1469.
260	4.00	33.65	258	26.74	133.8	4.96	5.64	1469.
270	3.94	33.66	268	26.75	132.6	5.10	6.00	1469.
280	3.91	33.67	278	26.76	131.5	5.23	6.37	1469.
290	3.89	33.67	288	26.76	131.3	5.36	6.75	1469.
300	3.85	33.68	298	26.78	130.3	5.49	7.15	1469.



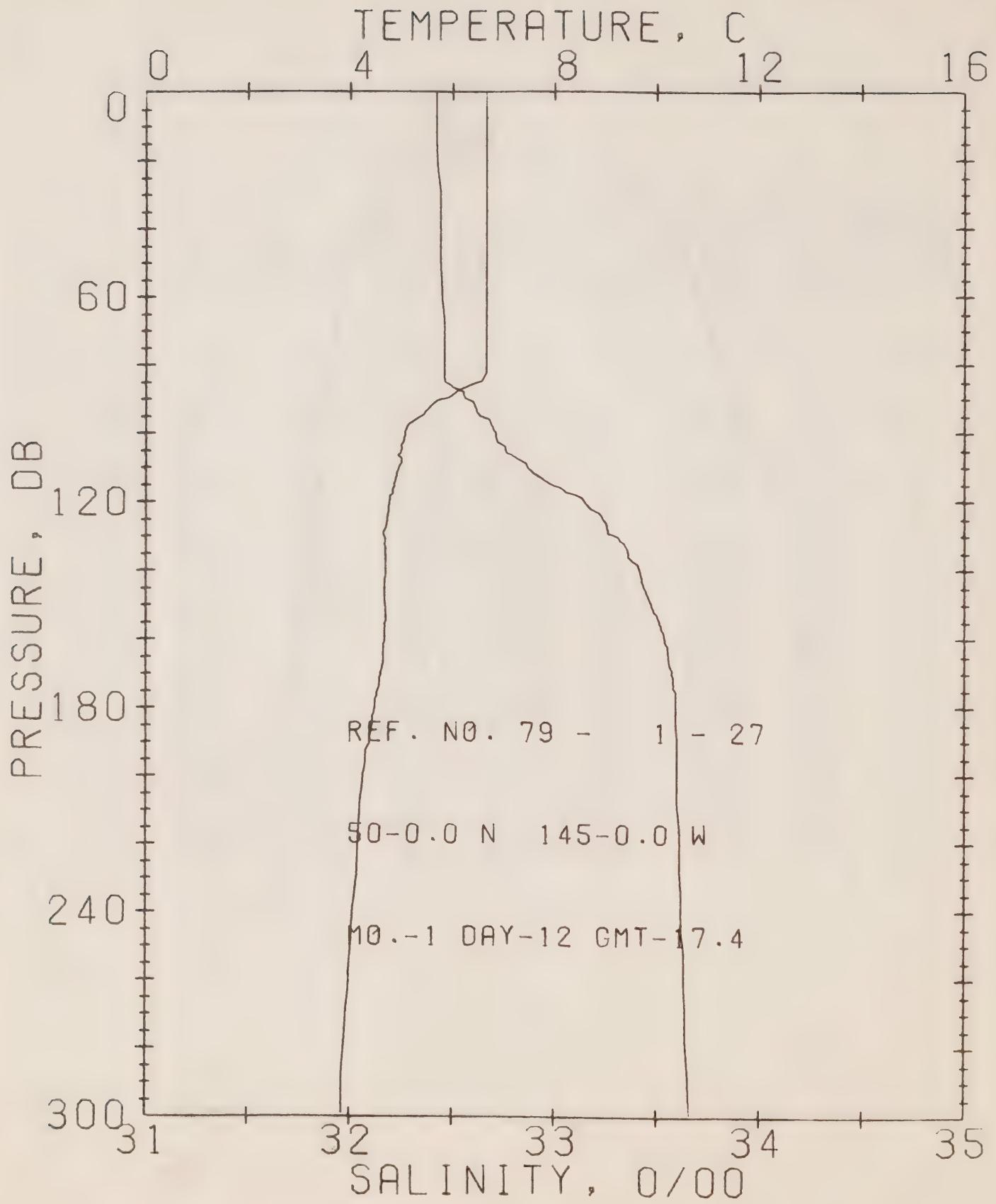
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REFERENCE NO. 79- 1- 26 DATE 11/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 162 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.71	32.44	0	25.47	252.2	.00	.00	1475.
10	6.71	32.45	10	25.47	251.8	.25	.01	1475.
20	6.71	32.45	20	25.47	251.7	.50	.05	1475.
30	6.71	32.46	30	25.48	251.1	.76	.12	1475.
50	6.71	32.46	50	25.48	251.2	1.26	.32	1475.
75	6.71	32.47	75	25.49	250.9	1.88	.72	1476.
100	5.41	32.69	99	25.82	219.3	2.48	1.25	1471.
125	4.59	33.07	124	26.22	182.2	2.98	1.82	1469.
150	4.58	33.33	149	26.42	162.8	3.41	2.42	1469.
175	4.63	33.58	174	26.62	144.7	3.79	3.05	1470.
200	4.40	33.62	199	26.67	139.9	4.14	3.72	1470.
225	4.20	33.63	223	26.70	137.0	4.49	4.47	1470.
250	4.05	33.64	248	26.72	134.9	4.83	5.29	1469.
300	3.85	33.68	298	26.78	130.3	5.49	7.15	1469.
400	3.67	33.81	397	26.90	119.2	6.73	11.58	1470.
500	3.52	33.94	496	27.02	108.8	7.88	16.82	1472.
600	3.35	34.05	595	27.12	99.6	8.92	22.65	1473.
800	3.00	34.21	793	27.27	85.7	10.77	35.80	1475.
1000	2.67	34.35	990	27.42	73.0	12.35	50.24	1477.
1200	2.40	34.47	1188	27.54	61.7	13.69	65.26	1479.



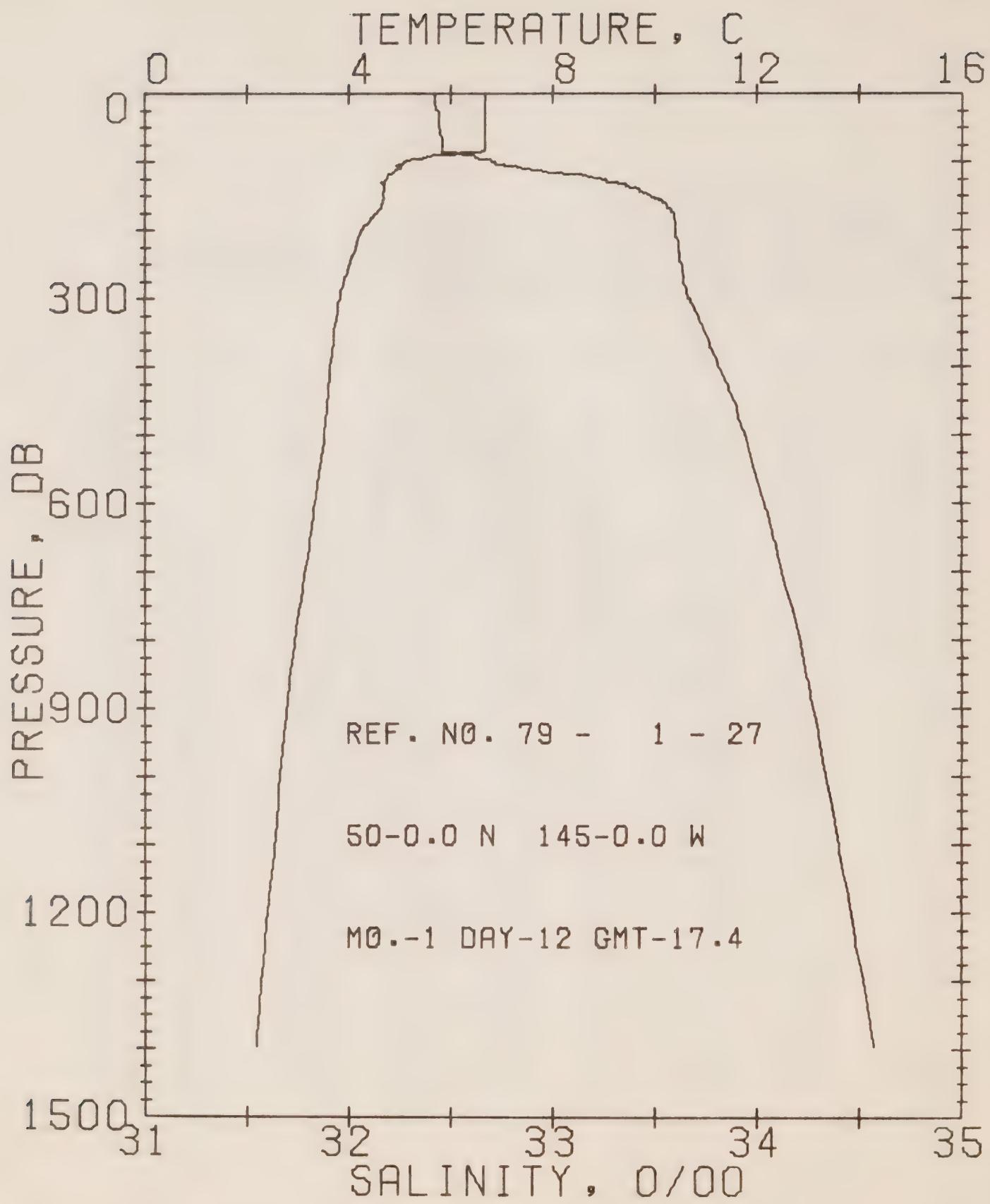
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 27 DATE 12/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.4 STATION P

RESULTS OF STP CAST 111 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.67	32.42	0	25.46	253.2	.00	.00	1474.
10	6.68	32.42	10	25.46	253.5	.25	.01	1475.
20	6.67	32.43	20	25.46	253.0	.51	.05	1475.
30	6.68	32.44	30	25.47	252.2	.76	.12	1475.
40	6.68	32.44	40	25.47	252.4	1.01	.21	1475.
50	6.68	32.44	50	25.47	252.3	1.26	.32	1475.
60	6.68	32.45	60	25.48	251.8	1.52	.46	1475.
70	6.67	32.46	70	25.49	251.1	1.77	.63	1476.
80	6.68	32.46	80	25.49	251.4	2.02	.82	1476.
90	5.92	32.56	89	25.66	234.8	2.26	1.03	1473.
100	5.07	32.71	99	26.88	214.1	2.49	1.25	1470.
110	4.96	32.87	109	26.02	201.0	2.70	1.47	1470.
120	4.77	33.14	119	26.25	178.6	2.89	1.70	1470.
130	4.63	33.31	129	26.40	164.7	3.06	1.92	1469.
140	4.69	33.42	139	26.48	157.2	3.22	2.14	1470.
150	4.69	33.47	149	26.53	153.1	3.37	2.37	1470.
160	4.67	33.54	159	26.58	148.4	3.53	2.60	1470.
170	4.59	33.57	169	26.61	145.1	3.67	2.85	1470.
180	4.47	33.59	179	26.64	142.5	3.82	3.11	1470.
190	4.37	33.60	189	26.66	140.7	3.96	3.37	1470.
200	4.25	33.60	199	26.67	139.6	4.10	3.65	1469.
210	4.19	33.60	209	26.68	138.9	4.24	3.94	1469.
220	4.15	33.61	218	26.69	138.0	4.37	4.25	1469.
230	4.11	33.61	228	26.70	137.4	4.51	4.56	1469.
240	4.05	33.62	238	26.71	136.3	4.65	4.89	1469.
250	4.00	33.63	248	26.72	135.4	4.79	5.23	1469.
260	3.97	33.63	258	26.72	135.0	4.92	5.58	1469.
270	3.93	33.64	268	26.74	133.8	5.05	5.94	1469.
280	3.88	33.64	278	26.74	133.2	5.19	6.32	1469.
290	3.85	33.65	288	26.75	132.4	5.32	6.70	1469.
300	3.82	33.66	298	26.76	131.3	5.45	7.10	1469.



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REFERENCE NO. 79- 1- 27 DATE 12/ 1/79

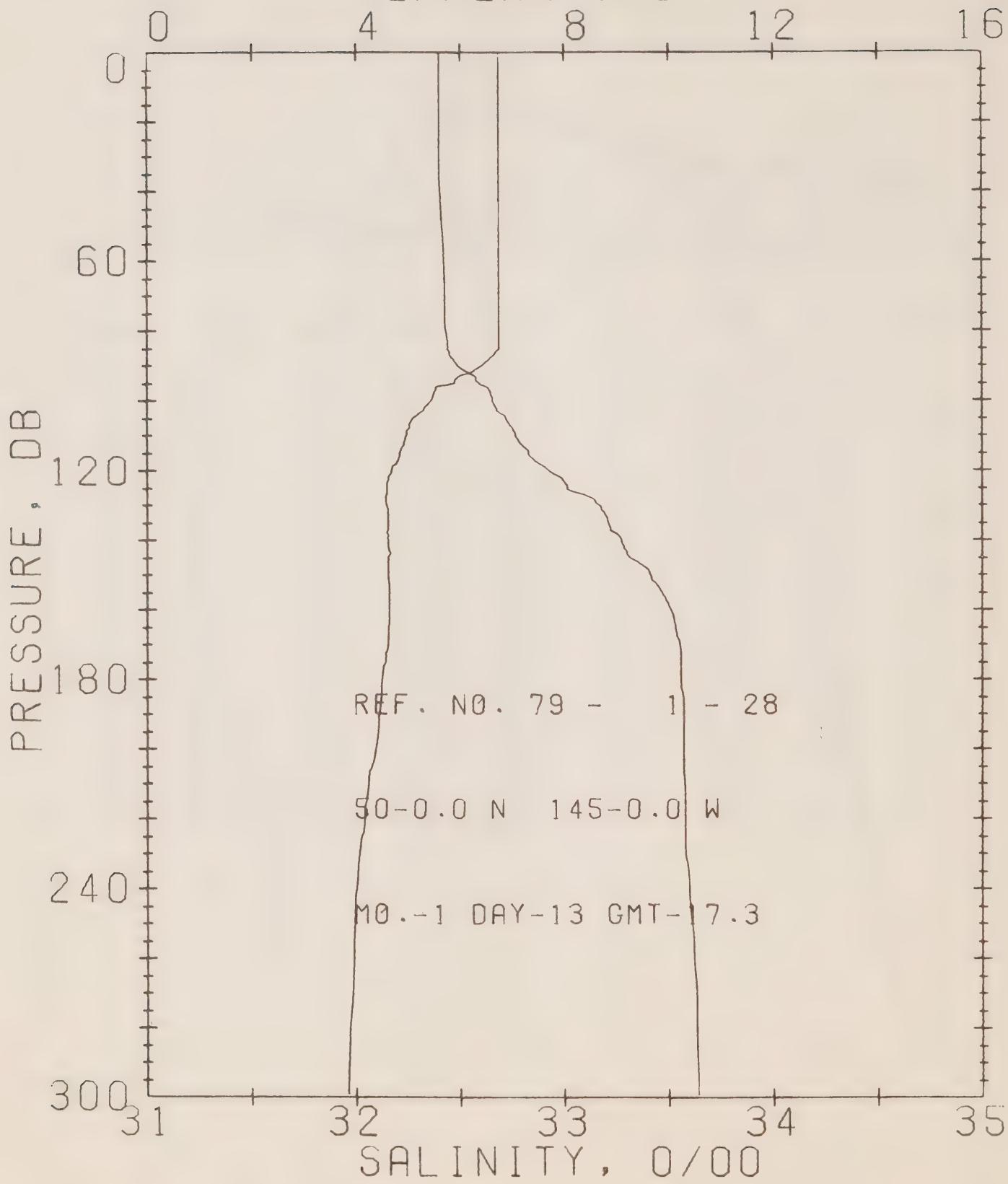
POSITION 50° .0N, 145° .0W GMT 17.4 STATION P

RESULTS OF STD CAST 177 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.67	32.42	0	25.46	253.2	.00	.00	1474.
10	6.68	32.42	10	25.46	253.5	.25	.01	1475.
20	6.67	32.43	20	25.46	253.0	.51	.05	1475.
30	6.68	32.44	30	25.47	252.2	.76	.12	1475.
50	6.68	32.44	50	25.47	252.3	1.26	.32	1475.
75	6.68	32.46	75	25.49	251.3	1.89	.72	1476.
100	5.07	32.71	99	25.81	214.1	2.49	1.25	1470.
125	4.73	33.24	124	26.33	170.9	2.97	1.81	1470.
150	4.69	33.47	149	26.53	153.1	3.37	2.37	1470.
175	4.53	33.59	174	26.63	143.0	3.74	2.98	1470.
200	4.25	33.60	199	26.67	139.6	4.10	3.65	1469.
225	4.13	33.61	223	26.69	137.8	4.44	4.40	1469.
250	4.00	33.63	248	26.72	135.4	4.79	5.23	1469.
300	3.82	33.66	298	26.76	131.3	5.45	7.10	1469.
400	3.64	33.81	397	26.90	118.9	6.70	11.54	1470.
500	3.52	33.94	496	27.01	109.0	7.84	16.75	1472.
600	3.34	34.03	595	27.11	100.8	8.89	22.62	1473.
700	2.95	34.21	793	27.22	85.2	10.75	35.83	1474.
1000	2.65	34.34	990	27.41	73.5	12.33	50.31	1477.
1200	2.40	34.46	1179	27.53	62.6	13.69	65.55	1479.

100

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 28

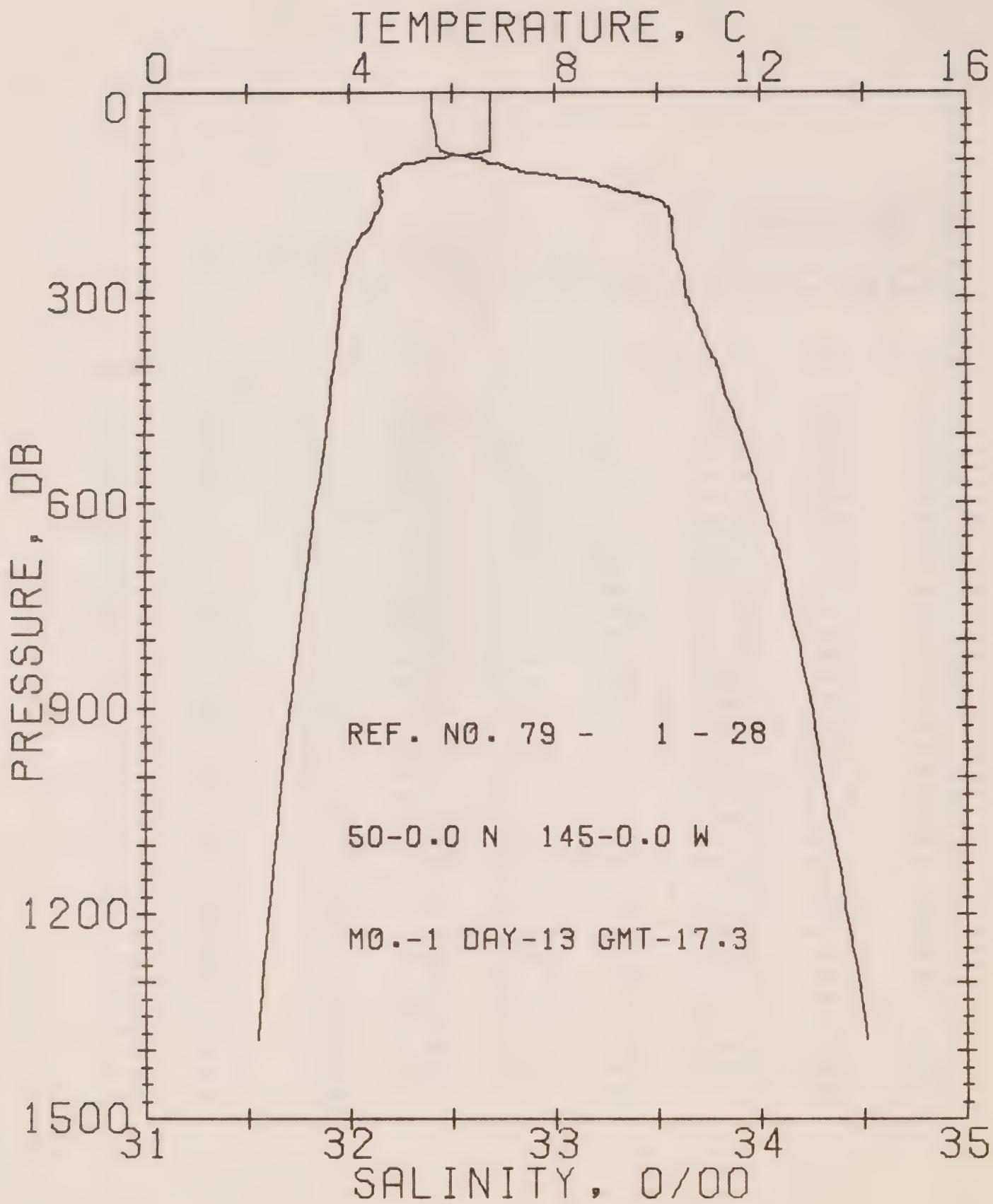
DATE 13/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 108 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.75	32.40	0	25.43	255.7	.00	.00	1475.
10	6.75	32.40	10	25.43	255.8	.26	.01	1475.
20	6.75	32.40	20	25.43	256.0	.51	.05	1475.
30	6.75	32.40	30	25.43	256.1	.77	.12	1475.
40	6.75	32.40	40	25.43	255.8	1.02	.21	1475.
50	6.75	32.41	50	25.44	255.2	1.28	.33	1475.
60	6.74	32.42	60	25.45	254.7	1.53	.47	1476.
70	6.75	32.43	70	25.45	254.3	1.79	.64	1476.
80	6.75	32.43	80	25.46	254.3	2.04	.83	1476.
90	6.39	32.49	89	25.55	245.6	2.30	1.05	1475.
100	5.43	32.65	99	25.79	222.5	2.53	1.27	1471.
110	4.95	32.77	109	25.94	208.4	2.74	1.50	1470.
120	4.66	32.93	119	26.10	193.4	2.94	1.74	1469.
130	4.59	33.17	129	26.29	174.7	3.13	1.98	1469.
140	4.62	33.28	139	26.38	157.1	3.30	2.21	1469.
150	4.62	33.41	149	26.49	156.8	3.46	2.45	1470.
160	4.65	33.51	159	26.56	150.0	3.61	2.69	1470.
170	4.60	33.55	169	26.60	146.5	3.76	2.94	1470.
180	4.50	33.56	179	26.61	145.0	3.91	3.20	1470.
190	4.44	33.57	189	26.63	143.7	4.05	3.47	1470.
200	4.36	33.57	199	26.64	143.0	4.20	3.76	1470.
210	4.23	33.57	209	26.65	141.3	4.34	4.06	1469.
220	4.16	33.58	218	26.66	140.3	4.48	4.36	1469.
230	4.06	33.58	228	26.67	139.4	4.62	4.69	1469.
240	4.01	33.60	238	26.70	137.4	4.76	5.02	1469.
250	3.97	33.61	248	26.71	136.2	4.89	5.36	1469.
260	3.94	33.62	258	26.72	135.3	5.03	5.71	1469.
270	3.91	33.63	268	26.73	134.5	5.16	6.08	1469.
280	3.88	33.63	278	26.73	134.2	5.30	6.45	1469.
290	3.85	33.64	288	26.74	133.6	5.43	6.84	1469.
300	3.84	33.64	298	26.75	132.9	5.57	7.24	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 28

DATE 13/ 1/79

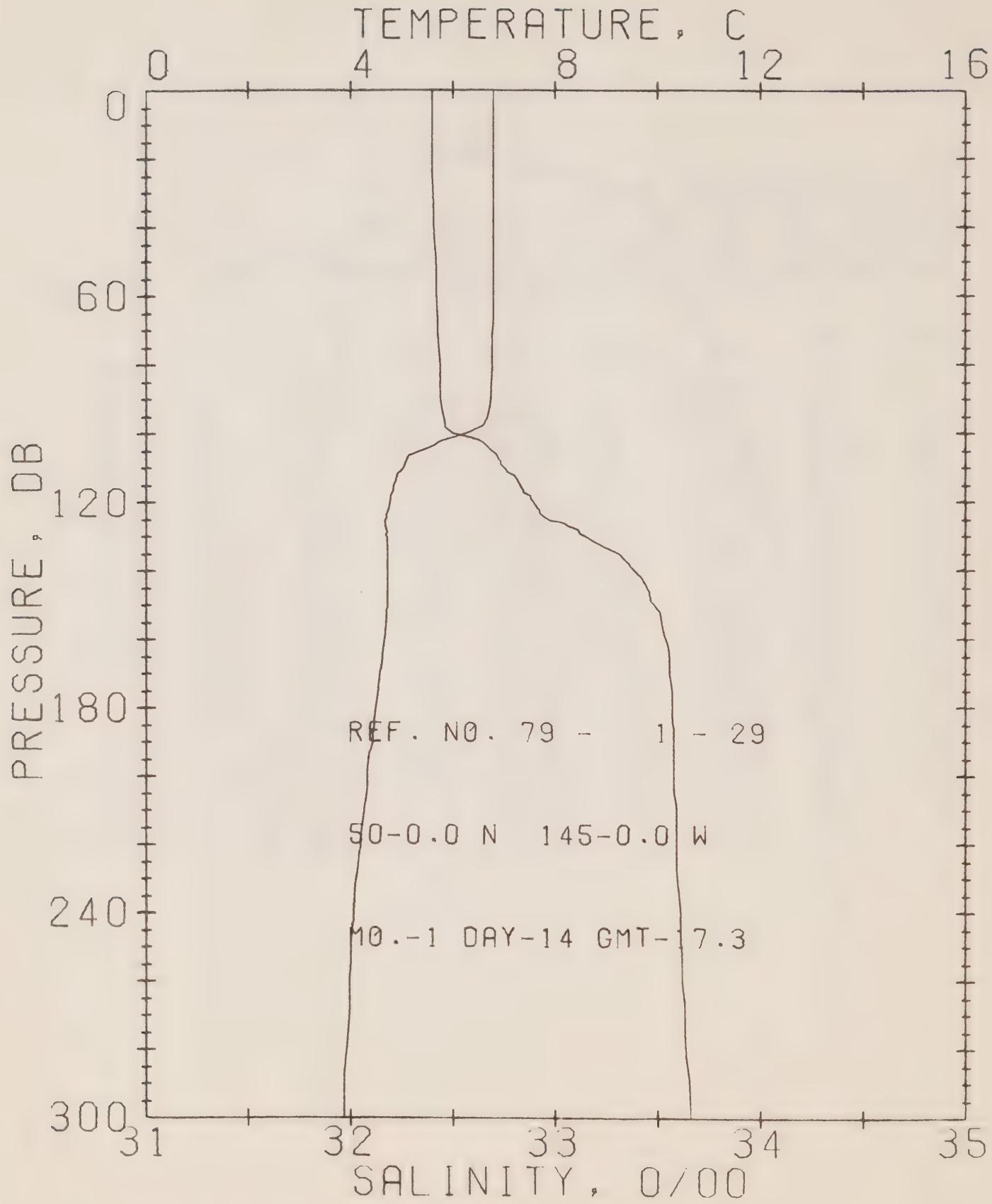
POSITION 50- .0N, 145- .0W

GMT 17.3

STATION P

RESULTS OF STP CAST 178 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DLPTH	SIGMA	SVA	DELTA	POT.	SOUND
				T	D	EN		
0	6.75	32.40	0	25.43	255.7	.00	.00	1475.
10	6.75	32.40	10	25.43	255.8	.26	.01	1475.
20	6.75	32.40	20	25.43	256.0	.51	.05	1475.
30	6.75	32.40	30	25.43	256.1	.77	.12	1475.
50	6.75	32.41	50	25.44	255.2	1.28	.33	1475.
75	6.75	32.43	75	25.45	254.4	1.92	.73	1476.
100	5.43	32.65	99	25.79	222.5	2.53	1.27	1471.
125	4.59	33.01	124	20.17	136.7	3.04	1.86	1469.
150	4.62	33.41	149	25.49	156.8	3.46	2.45	1470.
175	4.55	33.56	174	20.61	145.5	3.84	3.07	1470.
200	4.36	33.57	199	26.64	143.0	4.20	3.76	1470.
225	4.10	33.56	223	26.67	139.7	4.55	4.52	1469.
250	3.97	33.61	248	20.71	136.2	4.89	5.36	1469.
300	3.84	33.64	298	26.75	132.9	5.57	7.24	1469.
400	3.70	33.79	397	26.88	121.3	6.84	11.77	1470.
500	3.54	33.91	496	20.98	111.7	8.01	17.11	1472.
600	3.32	34.01	595	27.09	102.5	9.08	23.11	1472.
800	2.99	34.18	793	27.25	87.6	10.97	36.55	1475.
1000	2.66	34.30	990	27.38	76.3	12.60	51.52	1477.
1200	2.40	34.42	1188	27.49	66.1	14.02	67.38	1479.



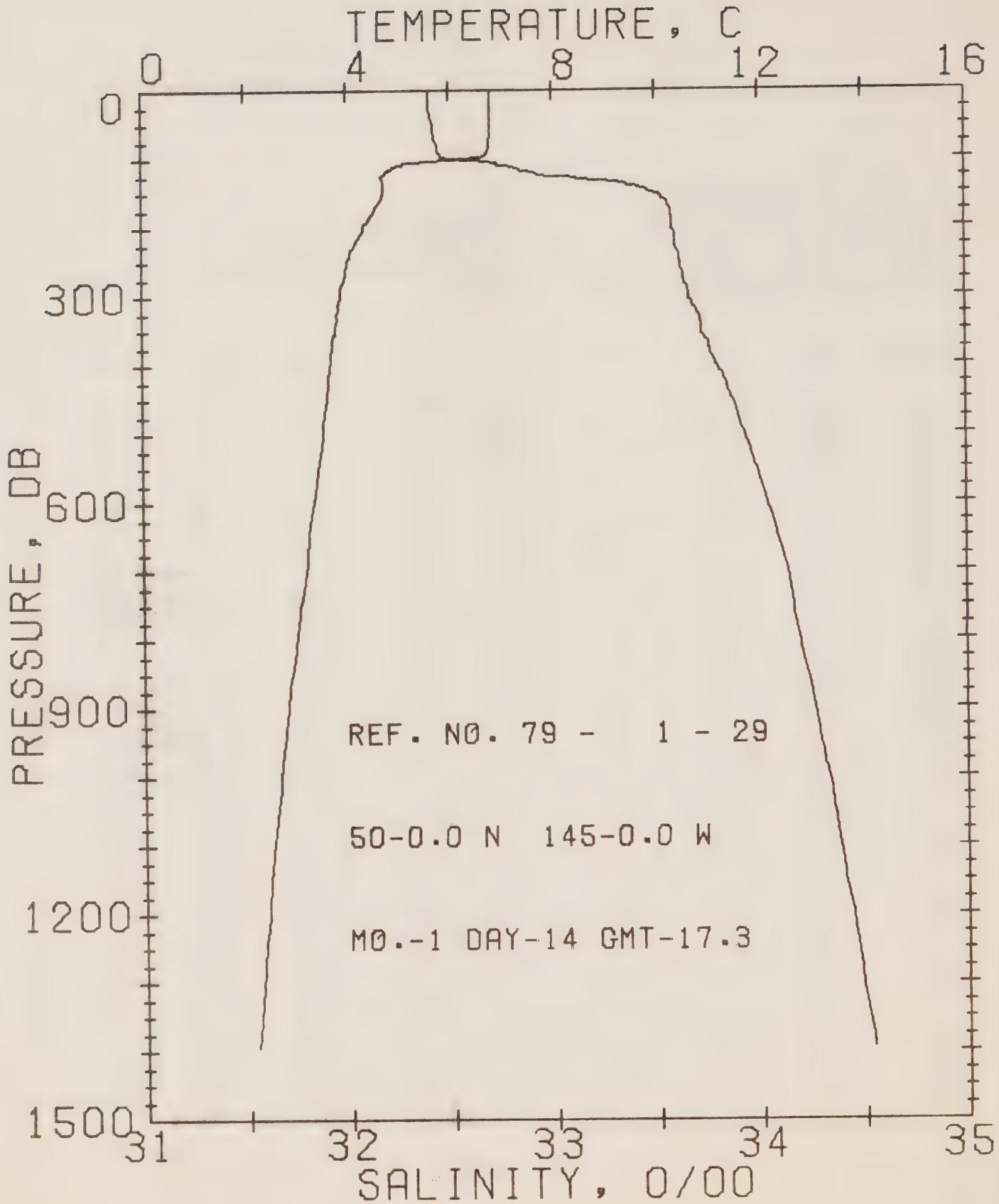
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 29 DATE 14/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 93 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DLPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.80	32.40	0	25.42	256.3	.00	.00	1475.
10	6.80	32.40	10	25.42	256.5	.26	.01	1475.
20	6.80	32.40	20	25.42	256.6	.51	.05	1475.
30	6.80	32.40	30	25.43	256.4	.77	.12	1475.
40	6.80	32.41	40	25.43	256.0	1.03	.21	1476.
50	6.80	32.42	50	25.44	255.6	1.28	.33	1476.
60	6.80	32.42	60	25.44	255.5	1.54	.47	1476.
70	6.78	32.43	70	25.45	254.8	1.79	.64	1476.
80	6.77	32.44	80	25.46	254.0	2.05	.83	1476.
90	6.76	32.44	89	25.46	254.0	2.30	1.05	1476.
100	6.29	32.50	99	25.57	243.8	2.55	1.30	1475.
110	5.04	32.75	109	25.91	210.8	2.77	1.53	1470.
120	4.77	32.89	119	26.06	197.3	2.98	1.77	1469.
130	4.70	33.15	129	26.27	177.4	3.16	2.01	1469.
140	4.73	33.39	139	26.45	159.8	3.33	2.24	1470.
150	4.73	33.46	149	26.53	152.8	3.49	2.47	1470.
160	4.65	33.54	159	26.58	148.2	3.64	2.71	1470.
170	4.57	33.56	169	26.61	145.7	3.78	2.95	1470.
180	4.50	33.57	179	26.62	144.2	3.93	3.21	1470.
190	4.43	33.58	189	26.64	142.8	4.07	3.48	1470.
200	4.33	33.58	199	26.65	141.9	4.21	3.77	1470.
210	4.26	33.59	209	26.66	140.5	4.36	4.06	1469.
220	4.19	33.59	218	26.67	139.8	4.50	4.37	1469.
230	4.10	33.60	228	26.68	138.6	4.64	4.69	1469.
240	4.05	33.61	238	26.70	137.1	4.77	5.02	1469.
250	4.00	33.61	248	26.71	136.5	4.91	5.36	1469.
260	3.97	33.62	258	26.72	135.6	5.05	5.71	1469.
270	3.96	33.63	268	26.72	134.9	5.18	6.08	1469.
280	3.92	33.64	278	26.73	134.1	5.32	6.46	1469.
290	3.87	33.65	288	26.75	132.5	5.45	6.84	1469.
300	3.86	33.66	298	26.76	131.9	5.58	7.24	1469.



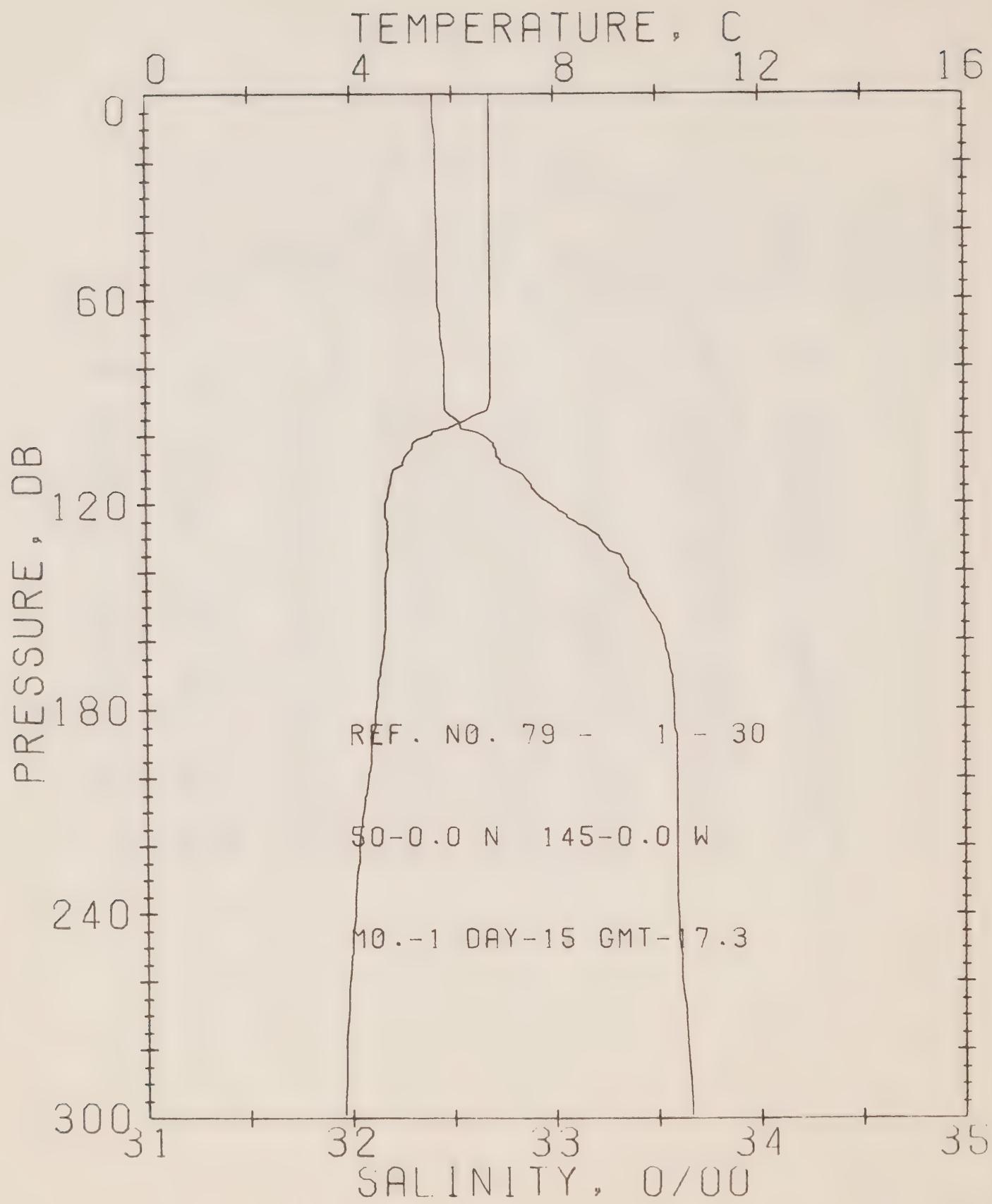
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 29 DATE 14/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF SIP CAST 176 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.80	32.40	0	25.42	256.3	.00	.00	1475.
10	6.80	32.40	10	25.42	256.5	.26	.01	1475.
20	6.80	32.40	20	25.42	256.6	.51	.05	1475.
30	6.80	32.40	30	25.43	256.4	.77	.12	1475.
50	6.80	32.42	50	25.44	255.6	1.28	.33	1476.
75	6.78	32.43	75	25.45	254.4	1.92	.73	1476.
100	6.29	32.50	99	25.57	243.8	2.55	1.30	1475.
125	4.70	32.97	124	26.12	190.8	3.07	1.89	1469.
150	4.73	33.46	149	26.53	152.8	3.49	2.47	1470.
175	4.54	33.57	174	26.62	144.6	3.86	3.08	1470.
200	4.33	33.58	199	26.65	141.9	4.21	3.77	1470.
225	4.14	33.59	223	26.67	139.4	4.57	4.53	1469.
250	4.00	33.61	248	26.71	136.5	4.91	5.36	1469.
300	3.86	33.66	298	26.76	131.9	5.58	7.24	1469.
400	3.66	33.79	397	26.88	120.8	6.85	11.75	1470.
500	3.51	33.93	496	27.00	110.0	8.00	17.01	1472.
600	3.32	34.03	595	27.11	100.6	9.05	22.90	1472.
800	2.97	34.19	793	27.26	86.9	10.91	36.13	1474.
1000	2.64	34.33	990	27.40	74.2	12.52	50.84	1477.
1200	2.39	34.44	1188	27.51	64.0	13.90	66.32	1479.



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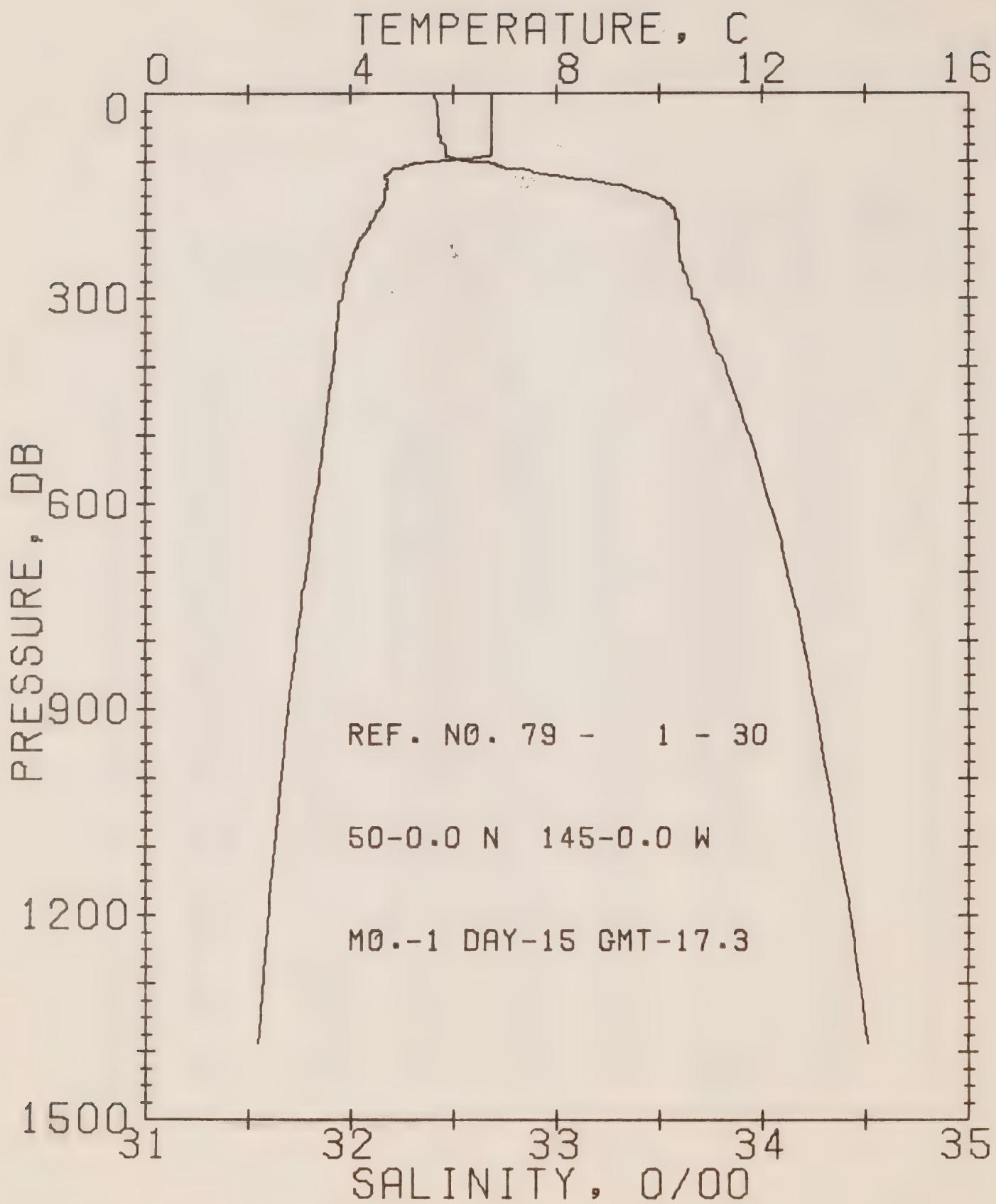
REFERENCE NO. 79- 1- 30 DATE 15/ 1/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 117 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.74	32.41	0	25.44	254.8	.00	.00	1475.
10	6.74	32.42	10	25.44	254.5	.25	.01	1475.
20	6.74	32.42	20	25.45	254.3	.51	.05	1475.
30	6.74	32.42	30	25.45	254.4	.76	.12	1475.
40	6.74	32.43	40	25.45	254.0	1.02	.21	1475.
50	6.75	32.43	50	25.45	254.1	1.27	.32	1475.
60	6.76	32.43	60	25.45	254.4	1.53	.47	1476.
70	6.75	32.44	70	25.46	253.5	1.78	.63	1476.
80	6.74	32.46	80	25.48	252.1	2.03	.83	1476.
90	6.73	32.46	89	25.48	252.1	2.28	1.05	1476.
100	5.57	32.65	99	25.77	224.1	2.53	1.28	1472.
110	4.84	32.80	109	25.97	204.9	2.74	1.51	1469.
120	4.68	32.98	119	26.13	189.8	2.94	1.74	1469.
130	4.71	33.22	129	26.32	172.3	3.12	1.97	1470.
140	4.69	33.30	139	26.43	161.6	3.29	2.20	1470.
150	4.67	33.46	149	26.52	154.0	3.44	2.43	1470.
160	4.65	33.53	159	26.58	148.4	3.59	2.67	1470.
170	4.56	33.57	169	26.61	144.8	3.74	2.92	1470.
180	4.47	33.58	179	26.63	143.2	3.89	3.17	1470.
190	4.38	33.59	189	26.65	141.6	4.03	3.44	1470.
200	4.32	33.59	199	26.66	141.1	4.17	3.72	1470.
210	4.21	33.59	209	26.67	140.0	4.31	4.02	1469.
220	4.14	33.59	218	26.67	139.4	4.45	4.32	1469.
230	4.08	33.59	228	26.68	138.8	4.59	4.64	1469.
240	4.04	33.60	238	26.69	137.9	4.73	4.98	1469.
250	3.99	33.61	248	26.70	136.9	4.86	5.32	1469.
260	3.94	33.61	258	26.71	135.9	5.00	5.67	1469.
270	3.90	33.63	268	26.73	134.2	5.14	6.04	1469.
280	3.88	33.64	278	26.74	133.2	5.27	6.41	1469.
290	3.86	33.65	288	26.75	132.3	5.40	6.80	1469.
300	3.84	33.66	298	26.76	131.6	5.53	7.19	1469.



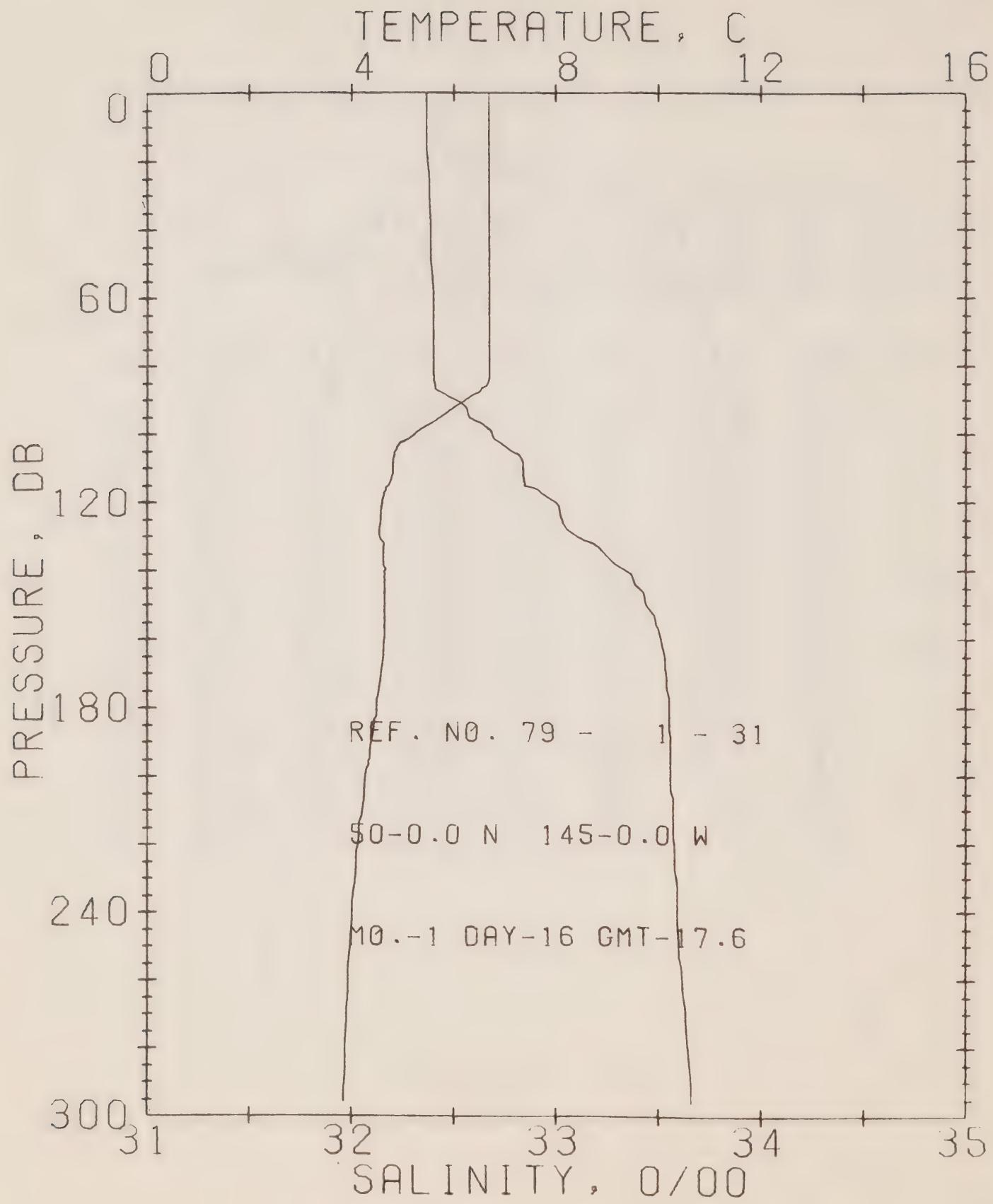
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REFERENCE NO. 75- 1- 30 DATE 15/ 1/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 139 POINTS TAKEN FROM ANALOG TRACE
MILLILINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.74	32.41	0	25.44	254.8	.00	.00	1475.
10	6.74	32.42	10	25.44	254.5	.25	.01	1475.
20	6.74	32.42	20	25.45	254.3	.51	.05	1475.
30	6.74	32.42	30	25.45	254.4	.76	.12	1475.
50	6.75	32.43	50	25.45	254.1	1.27	.32	1475.
75	6.74	32.45	75	25.47	252.7	1.91	.73	1476.
100	5.57	32.65	99	25.77	224.1	2.53	1.28	1472.
125	4.72	33.10	124	26.23	151.3	3.03	1.86	1469.
150	4.67	33.46	149	26.52	154.0	3.44	2.43	1470.
175	4.51	33.57	174	26.62	144.0	3.81	3.05	1470.
200	4.32	33.59	199	26.66	141.1	4.17	3.72	1470.
225	4.12	33.59	223	26.68	139.2	4.52	4.48	1469.
250	3.99	33.61	248	26.70	136.9	4.86	5.32	1469.
300	3.84	33.66	298	26.76	131.6	5.53	7.19	1469.
400	3.65	33.82	397	26.91	118.4	6.78	11.62	1470.
500	3.49	33.93	496	27.01	109.0	7.92	16.83	1471.
600	3.30	34.03	595	27.11	100.6	8.96	22.69	1472.
700	2.94	34.19	793	27.27	96.1	10.82	35.89	1474.
1000	2.63	34.31	990	27.39	75.0	12.42	50.57	1476.
1200	2.39	34.43	1138	27.50	65.1	13.82	66.22	1479.



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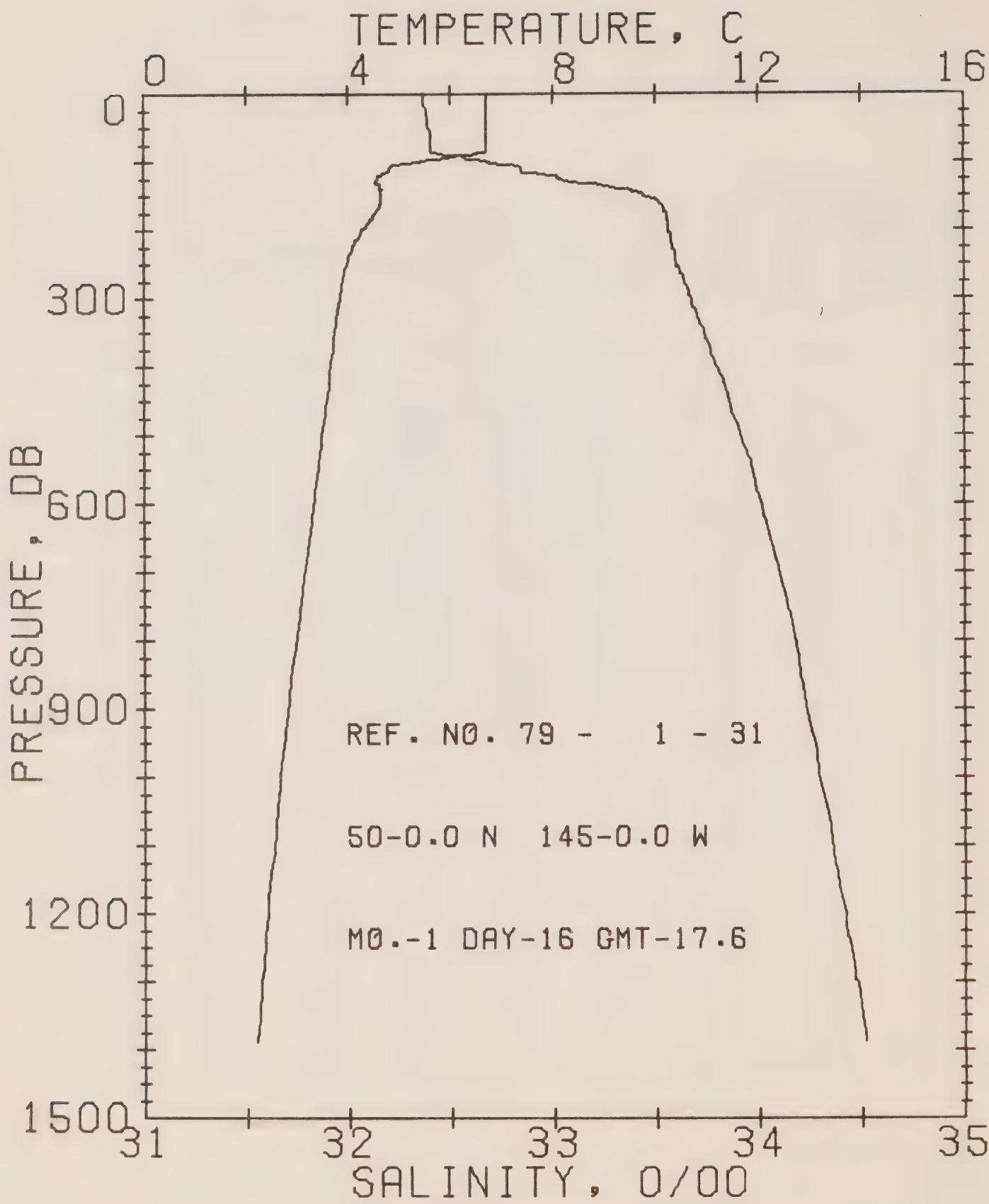
REFERENCE NO. 79- 1- 31 DATE 16/ 1/79

POSITION 50° .0N, 145° .0W GMT 17.6 STATION P

RESULTS OF STP CAST 102 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.70	32.37	0	25.41	257.3	.00	.00	1474.
10	6.70	32.37	10	25.41	257.5	.26	.01	1475.
20	6.70	32.37	20	25.42	257.3	.51	.05	1475.
30	6.70	32.36	30	25.42	257.0	.77	.12	1475.
40	6.70	32.39	40	25.43	256.3	1.03	.21	1475.
50	6.69	32.39	50	25.43	256.3	1.28	.33	1475.
60	6.69	32.40	60	25.44	255.7	1.54	.47	1475.
70	6.69	32.40	70	25.44	255.8	1.80	.64	1476.
80	6.70	32.40	80	25.44	256.1	2.05	.84	1476.
90	6.26	32.50	89	25.57	243.3	2.31	1.06	1474.
100	5.24	32.68	99	25.84	217.7	2.54	1.28	1471.
110	4.79	32.84	109	26.01	201.4	2.74	1.50	1469.
120	4.59	33.00	119	26.16	187.4	2.94	1.73	1469.
130	4.54	33.10	129	26.24	179.5	3.12	1.97	1469.
140	4.66	33.35	139	26.43	162.1	3.29	2.20	1470.
150	4.64	33.44	149	26.50	155.2	3.45	2.43	1470.
160	4.63	33.51	159	26.56	150.0	3.60	2.67	1470.
170	4.57	33.54	169	26.59	147.4	3.75	2.92	1470.
180	4.48	33.55	179	26.61	145.5	3.90	3.18	1470.
190	4.37	33.56	189	26.63	143.7	4.04	3.46	1470.
200	4.27	33.56	199	26.64	142.8	4.19	3.74	1469.
210	4.20	33.57	209	26.65	141.4	4.33	4.04	1469.
220	4.11	33.58	218	26.67	140.0	4.47	4.35	1469.
230	4.05	33.59	228	26.68	138.8	4.61	4.67	1469.
240	4.00	33.59	238	26.69	138.0	4.75	5.00	1469.
250	3.97	33.60	248	26.70	137.1	4.89	5.34	1469.
260	3.93	33.61	258	26.72	135.7	5.02	5.70	1469.
270	3.90	33.63	268	26.73	134.3	5.16	6.06	1469.
280	3.87	33.64	278	26.74	133.2	5.29	6.44	1469.
290	3.85	33.66	288	26.76	131.9	5.42	6.82	1469.
300	3.83	33.67	298	26.77	131.1	5.56	7.22	1469.



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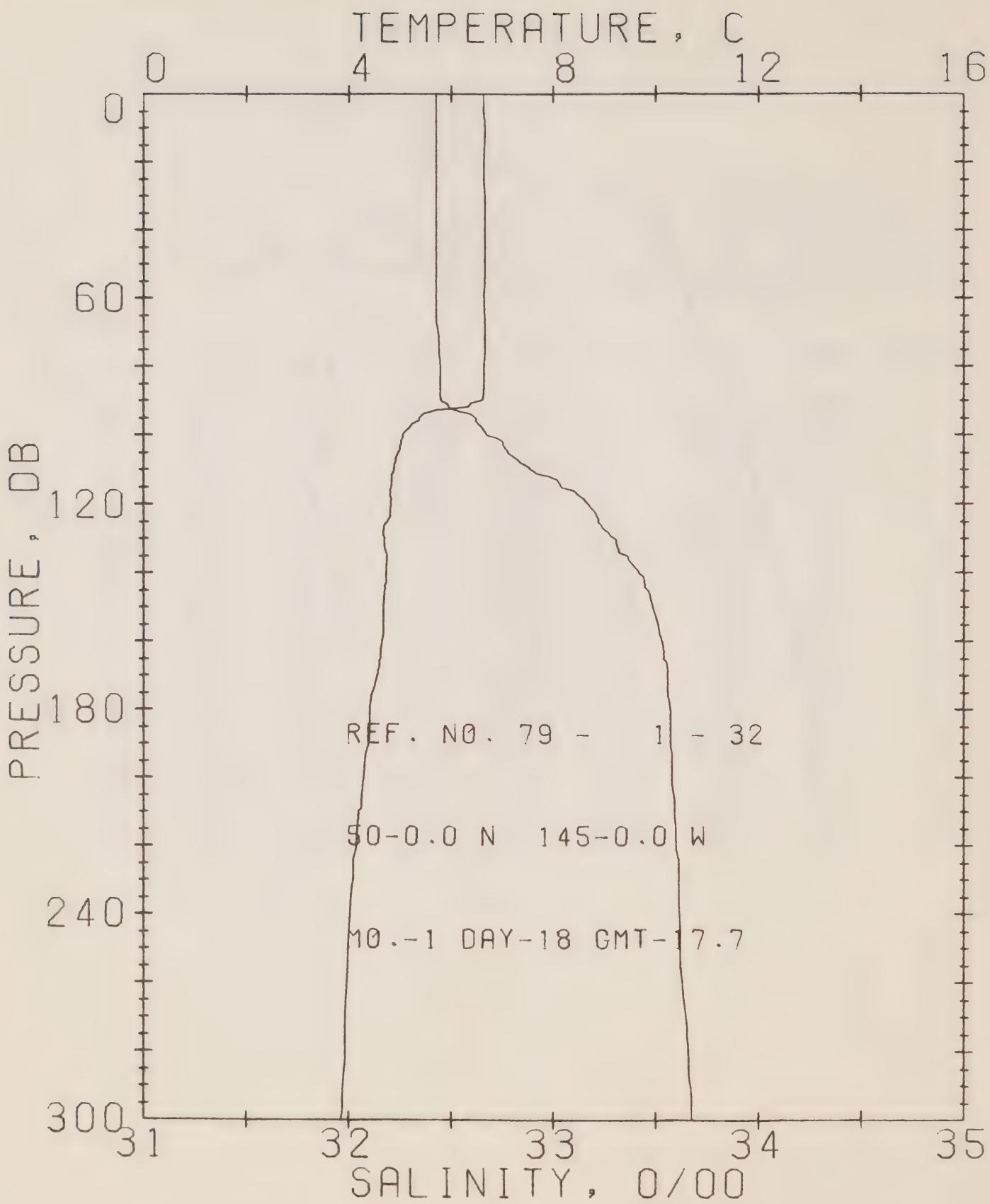
REFERENCE NO. 79- 1- 31 DATE 16/11/79

POSITION 50- .0N, 145- .0W GMT 17.6 STATION P

RESULTS OF STP CAST 160 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.70	32.37	0	25.41	257.3	.00	.00	1474.
10	6.70	32.37	10	25.41	257.5	.26	.01	1475.
20	6.70	32.37	20	25.42	257.3	.51	.05	1475.
30	6.70	32.38	30	25.42	257.0	.77	.12	1475.
50	6.69	32.39	50	25.43	256.3	1.28	.33	1475.
75	6.69	32.46	75	25.44	255.9	1.92	.73	1476.
100	5.24	32.68	99	25.84	217.7	2.54	1.28	1471.
125	4.56	33.03	124	26.16	185.2	3.03	1.85	1469.
150	4.64	33.44	149	26.50	155.2	3.45	2.43	1470.
175	4.53	33.54	174	26.60	146.5	3.83	3.05	1470.
200	4.27	33.56	199	26.64	142.8	4.19	3.74	1469.
225	4.07	33.58	223	26.67	139.5	4.54	4.51	1469.
250	3.97	33.60	248	26.70	137.1	4.89	5.34	1469.
300	3.83	33.67	298	26.77	131.1	5.56	7.22	1469.
400	3.65	33.79	397	26.89	120.4	6.81	11.70	1470.
500	3.48	33.91	496	26.99	110.9	7.97	16.98	1471.
600	3.32	34.01	595	27.09	102.6	9.03	22.94	1472.
800	2.90	34.18	793	27.25	87.5	10.93	36.42	1474.
1000	2.65	34.29	990	27.37	76.7	12.57	51.47	1477.
1200	2.39	34.42	1188	27.50	65.7	13.99	67.36	1479.



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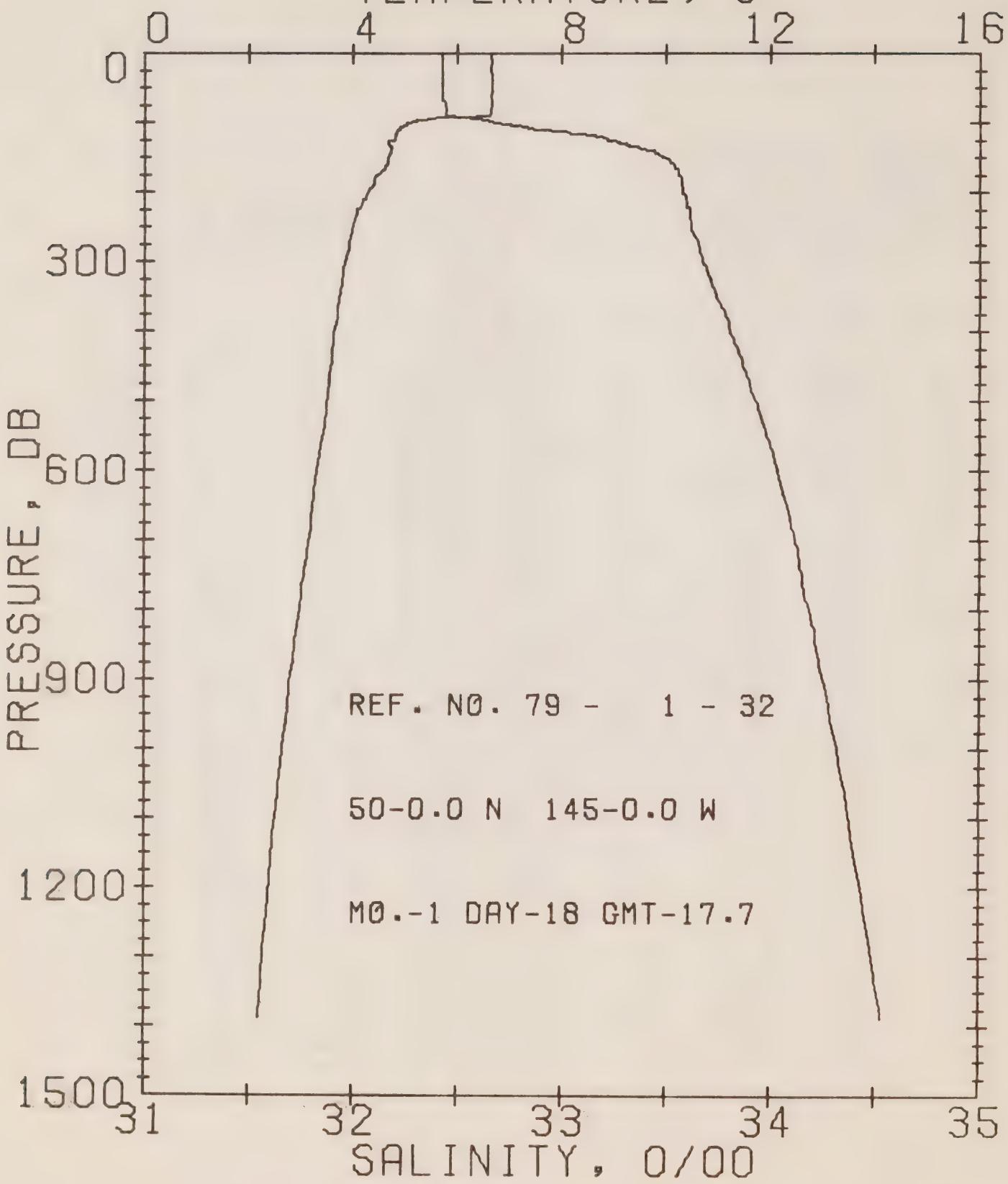
REFERENCE NO. 79-1-32 DATE 18/1/79

POSITION 50° 00'N 145° 00'W GMT 17.7 STATION P

RESULTS OF STP CAST 167 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	0.65	32.43	0	25.47	252.2	.00	.00	1474.
10	0.66	32.43	10	25.47	252.5	.25	.01	1474.
20	0.65	32.43	20	25.47	252.5	.50	.05	1475.
30	0.66	32.43	30	25.47	252.7	.76	.12	1475.
40	0.66	32.43	40	25.47	252.9	1.01	.21	1475.
50	0.66	32.43	50	25.47	253.0	1.26	.32	1475.
60	0.65	32.43	60	25.47	253.0	1.52	.46	1475.
70	0.66	32.44	70	25.47	252.7	1.77	.63	1475.
80	0.65	32.45	80	25.48	251.7	2.02	.82	1476.
90	0.62	32.45	99	25.49	251.5	2.27	1.04	1476.
100	0.04	32.67	99	25.85	216.7	2.50	1.26	1470.
110	4.87	32.89	109	26.05	198.2	2.71	1.49	1469.
120	4.81	33.17	119	26.27	177.3	2.90	1.70	1470.
130	4.69	33.31	129	26.39	165.3	3.07	1.92	1470.
140	4.72	33.42	139	26.48	157.5	3.23	2.15	1470.
150	4.68	33.49	149	26.54	151.9	3.38	2.37	1470.
160	4.65	33.53	159	26.57	148.7	3.53	2.61	1470.
170	4.55	33.56	169	26.61	145.5	3.68	2.86	1470.
180	4.41	33.57	179	26.63	143.3	3.83	3.12	1470.
190	4.37	33.57	189	26.64	143.0	3.97	3.39	1470.
200	4.29	33.58	199	26.65	141.4	4.11	3.67	1469.
210	4.20	33.59	209	26.67	139.9	4.25	3.96	1469.
220	4.14	33.60	218	26.68	138.6	4.39	4.27	1469.
230	4.07	33.61	228	26.70	137.2	4.53	4.58	1469.
240	4.01	33.61	238	26.71	136.5	4.66	4.91	1469.
250	3.98	33.62	248	26.71	135.7	4.80	5.25	1469.
260	3.95	33.63	258	26.72	135.0	4.94	5.60	1469.
270	3.93	33.64	268	26.74	133.5	5.07	5.96	1469.
280	3.91	33.66	278	26.75	132.5	5.20	6.34	1469.
290	3.88	33.67	288	26.76	131.6	5.34	6.72	1469.
300	3.85	33.67	299	26.77	131.0	5.47	7.12	1469.

TEMPERATURE, C



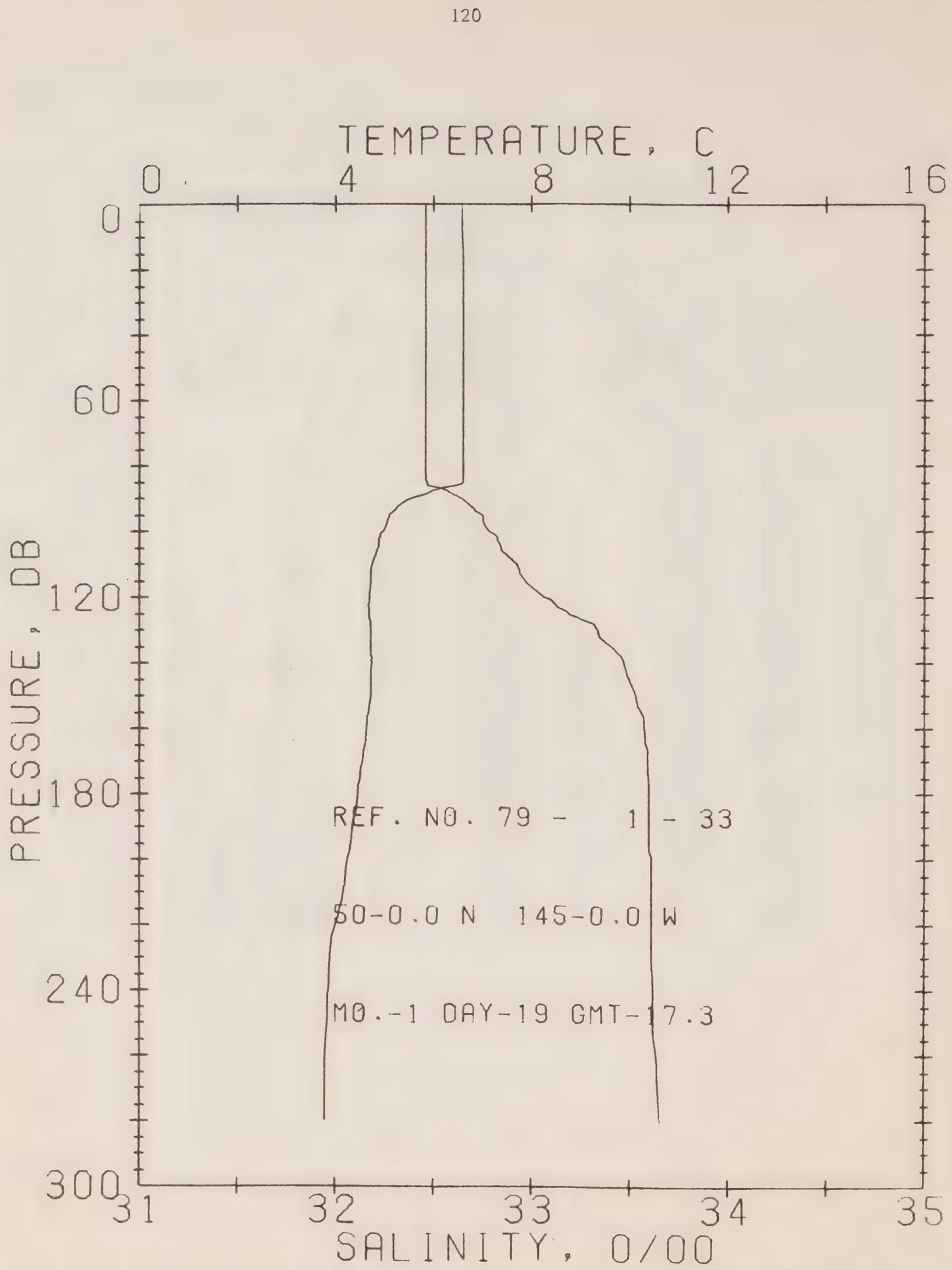
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 32 DATE 18/ 1/79

POSITION 50° 0'N, 145° 0'W GMT 17.7 STATION P

RESULTS OF STP CAST 193 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.65	32.43	0	25.47	252.2	.00	.00	1474.
10	6.66	32.43	10	25.47	252.5	.25	.01	1474.
20	6.65	32.43	20	25.47	252.5	.50	.05	1475.
30	6.66	32.43	30	25.47	252.7	.76	.12	1475.
50	6.68	32.43	50	25.47	253.0	1.26	.32	1475.
75	6.66	32.44	75	25.47	252.5	1.90	.72	1476.
100	5.04	32.67	99	25.85	216.7	2.50	1.26	1470.
125	4.75	33.22	124	26.32	172.6	2.98	1.81	1470.
150	4.68	33.49	149	26.54	151.9	3.38	2.37	1470.
175	4.47	33.50	174	26.62	144.6	3.75	2.99	1470.
200	4.29	33.58	199	26.65	141.4	4.11	3.67	1469.
225	4.08	33.61	223	26.70	137.3	4.46	4.42	1469.
250	3.98	33.62	248	26.71	135.7	4.80	5.25	1469.
300	3.85	33.67	298	26.77	131.0	5.47	7.12	1469.
400	3.64	33.81	397	26.90	119.4	6.71	11.56	1470.
500	3.51	33.93	496	27.01	109.7	7.86	16.79	1471.
600	3.32	34.03	595	27.11	100.8	8.91	22.68	1472.
800	2.97	34.16	793	27.26	97.0	10.78	36.00	1474.
1000	2.64	34.32	990	27.40	74.5	12.40	50.79	1477.
1200	2.37	34.43	1168	27.51	54.5	13.79	66.34	1479.



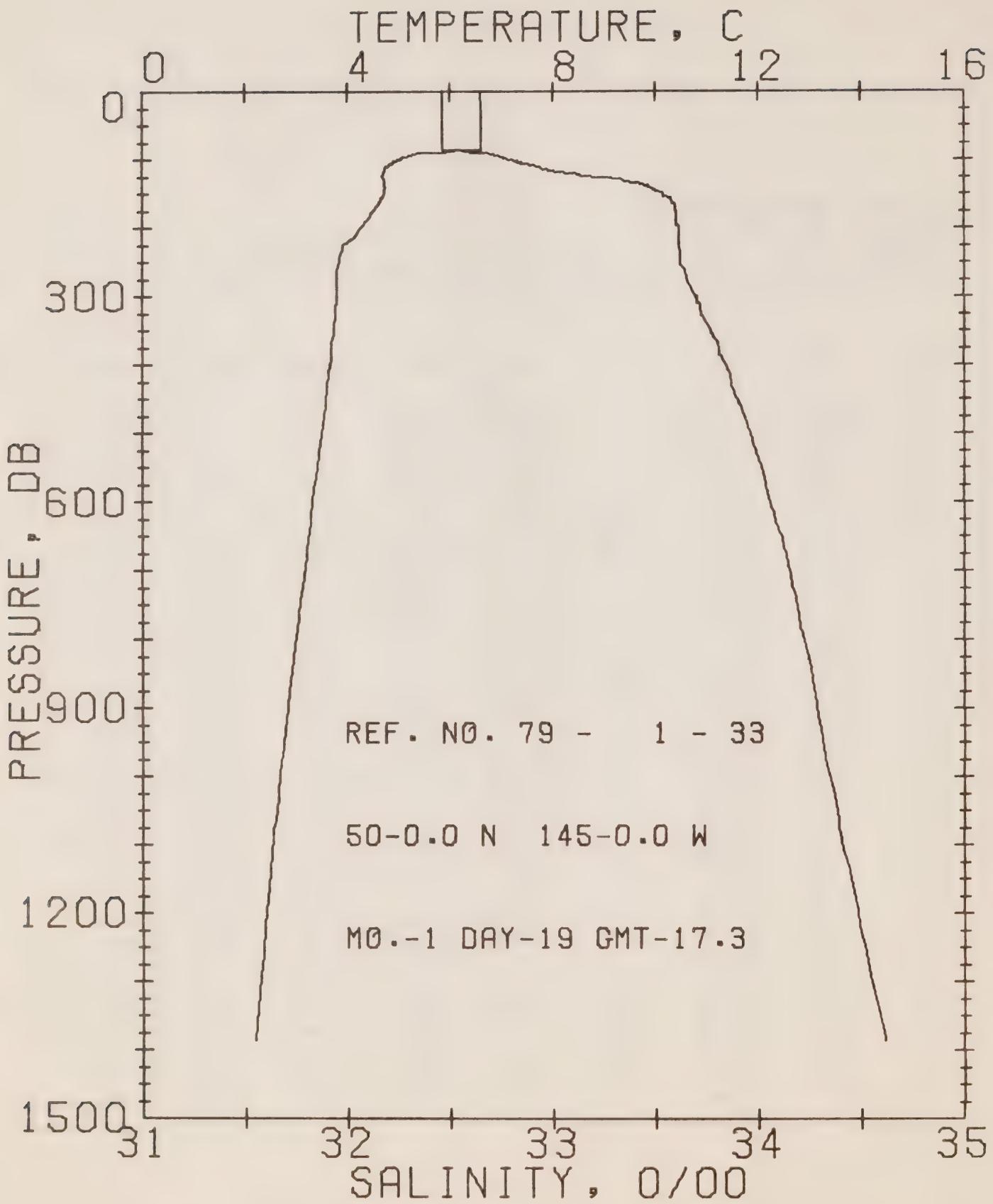
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 33 DATE 19/ 1/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 103 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.59	32.46	0	25.50	249.3	.00	.00	1474.
10	6.60	32.46	10	25.50	249.5	.25	.01	1474.
20	6.61	32.46	20	25.50	249.8	.50	.05	1475.
30	6.62	32.46	30	25.49	250.0	.75	.11	1475.
40	6.62	32.46	40	25.49	250.1	1.00	.20	1475.
50	6.62	32.46	50	25.49	250.2	1.25	.32	1475.
60	6.62	32.46	60	25.49	250.4	1.50	.46	1475.
70	6.62	32.46	70	25.49	250.5	1.75	.62	1475.
80	6.62	32.46	80	25.49	250.6	2.00	.82	1476.
90	6.57	32.64	89	25.77	224.8	2.25	1.03	1472.
100	4.99	32.78	99	25.94	207.9	2.46	1.24	1470.
110	4.74	32.93	109	26.09	194.1	2.66	1.45	1469.
120	4.69	33.06	119	26.20	183.9	2.85	1.67	1469.
130	4.72	33.34	129	26.42	153.4	3.02	1.89	1470.
140	4.74	33.47	139	26.52	153.5	3.18	2.11	1470.
150	4.72	33.53	149	26.57	149.3	3.33	2.34	1470.
160	4.62	33.57	159	26.61	145.1	3.48	2.57	1470.
170	4.55	33.59	169	26.63	143.2	3.62	2.81	1470.
180	4.44	33.66	179	26.64	141.4	3.77	3.06	1470.
190	4.34	33.66	189	26.66	140.4	3.91	3.33	1470.
200	4.25	33.61	199	26.68	138.8	4.05	3.61	1469.
210	4.16	33.61	209	26.69	138.0	4.19	3.90	1469.
220	3.99	33.61	218	26.71	136.3	4.32	4.20	1469.
230	3.89	33.61	228	26.72	135.3	4.46	4.51	1468.
240	3.80	33.62	238	26.73	134.5	4.59	4.83	1468.
250	3.83	33.62	248	26.73	134.2	4.73	5.17	1468.
260	3.80	33.64	258	26.74	132.9	4.86	5.52	1468.
270	3.79	33.64	268	26.75	132.3	4.99	5.87	1469.
280	3.78	33.65	278	26.76	131.7	5.13	6.24	1469.
290	3.78	33.67	288	26.77	130.4	5.26	6.62	1469.
300	3.78	33.69	298	26.79	129.1	5.39	7.01	1469.



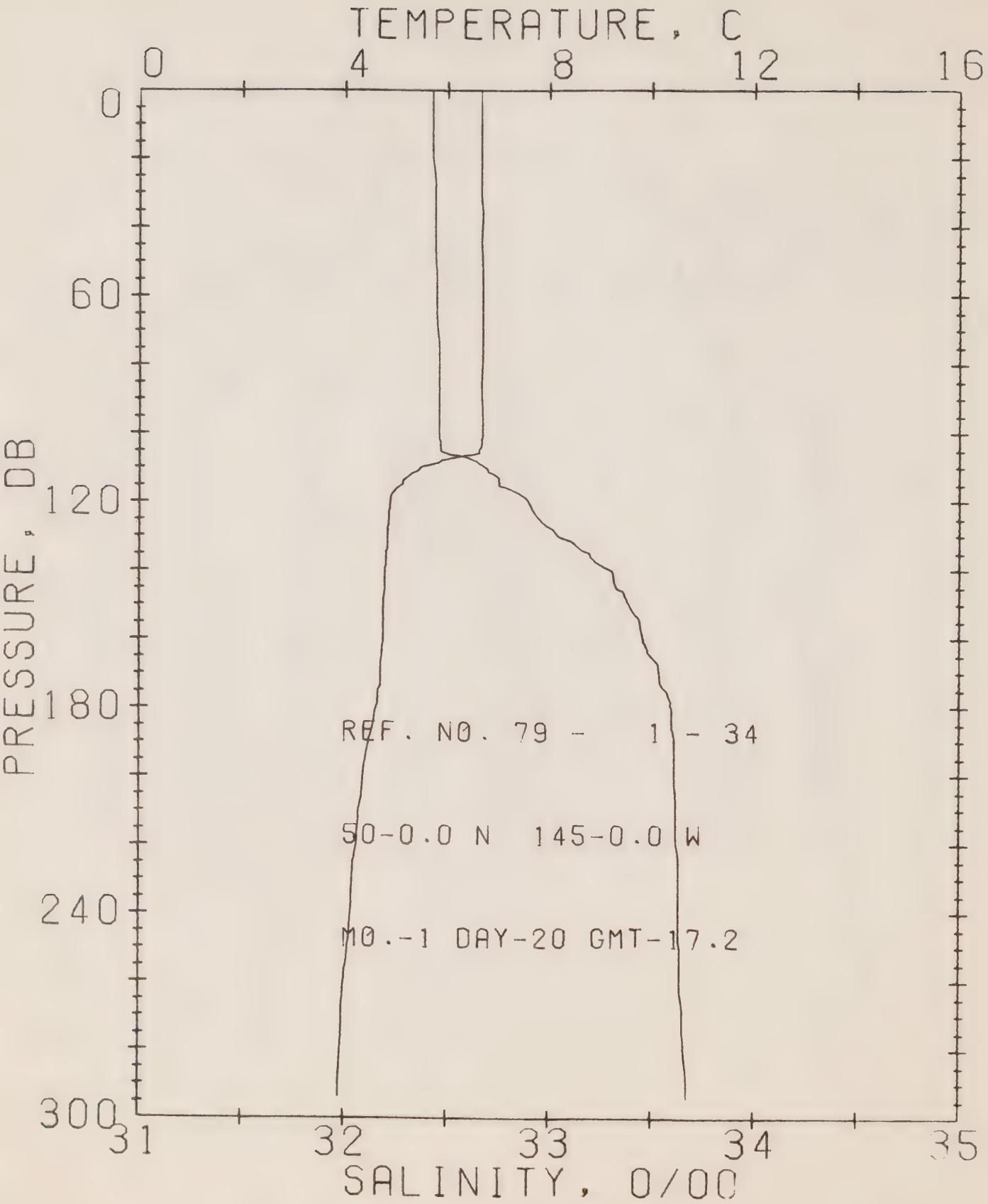
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 33 DATE 19/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 175 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	0.59	32.46	0	25.50	249.3	.00	.00	1474.
10	6.60	32.46	10	25.50	249.5	.25	.01	1474.
20	6.61	32.46	20	25.50	249.8	.50	.05	1475.
30	6.62	32.46	30	25.49	250.0	.75	.11	1475.
50	6.62	32.46	50	25.49	250.2	1.25	.32	1475.
75	6.62	32.46	75	25.49	250.5	1.88	.72	1475.
100	4.99	32.78	99	25.94	207.9	2.46	1.24	1470.
125	4.70	33.19	124	26.30	174.4	2.94	1.78	1469.
150	4.72	33.53	149	26.57	149.3	3.33	2.34	1470.
175	4.50	33.59	174	26.64	142.4	3.70	2.94	1470.
200	4.25	33.61	199	26.68	138.8	4.05	3.61	1469.
225	3.92	33.61	223	26.71	135.7	4.39	4.35	1468.
250	3.83	33.62	248	26.73	134.2	4.73	5.17	1468.
300	3.78	33.69	298	26.79	129.1	5.39	7.01	1469.
400	3.65	33.84	397	26.92	117.3	6.62	11.40	1470.
500	3.51	33.90	496	27.03	107.6	7.74	16.55	1472.
600	3.31	34.05	595	27.12	99.5	8.78	22.32	1472.
800	2.93	34.21	793	27.28	84.9	10.61	35.34	1475.
1000	2.67	34.34	990	27.41	73.4	12.18	49.77	1477.
1200	2.40	34.48	1188	27.55	61.1	13.53	64.79	1479.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79-1-34 DATE 20/1/79

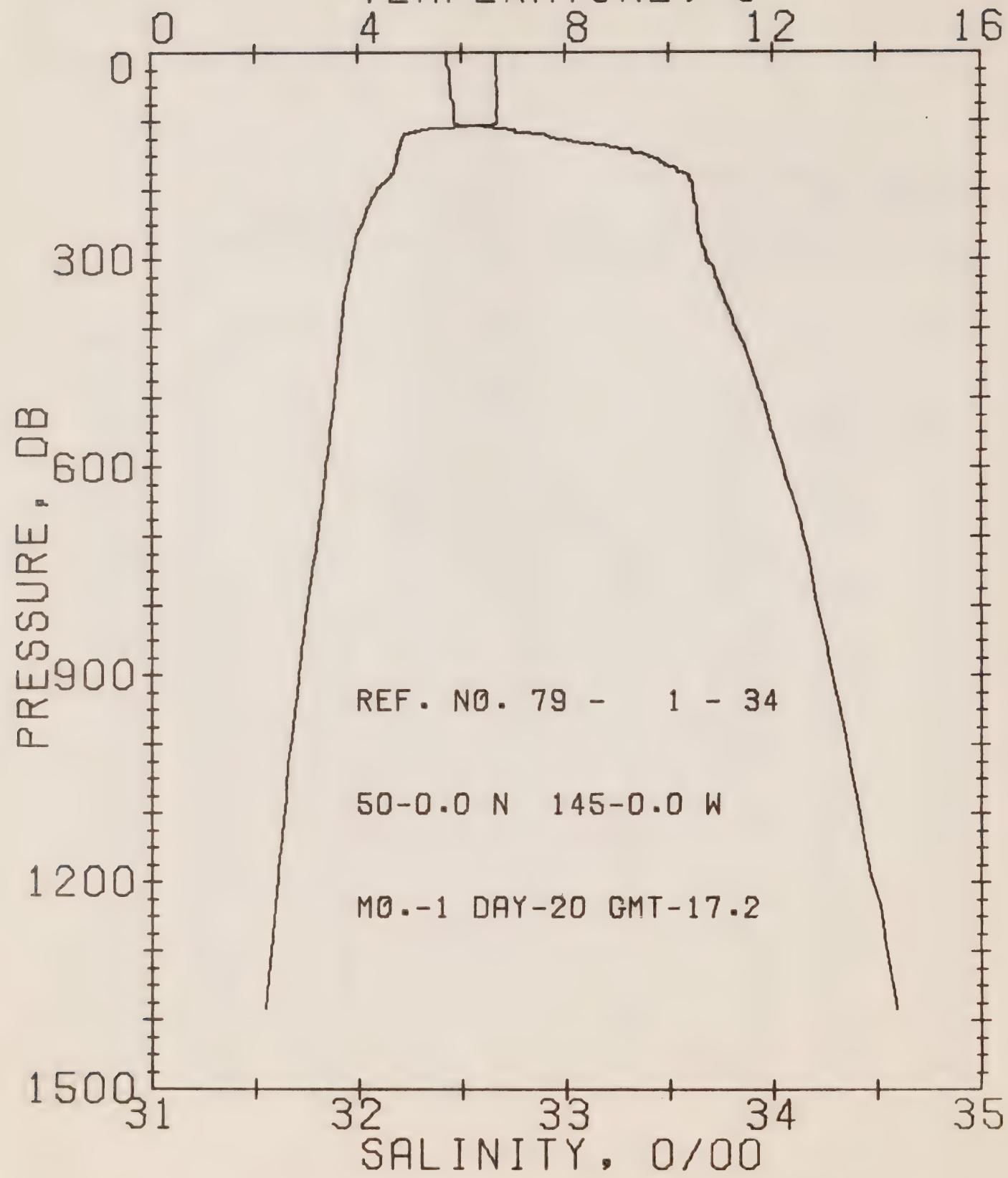
POSITION 50° 0'N 145° 0'W GMT 17.2 STATION P

RESULTS OF STP CAST 113 POINTS TAKEN FROM ANALOG TRACE

GUILDFORD WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELT A D	POT. EN	SOUND
0	0.67	32.43	0	25.46	252.5	.00	.00	1474.
10	0.66	32.43	10	25.47	252.5	.25	.01	1474.
20	0.68	32.43	20	25.47	252.8	.51	.05	1475.
30	0.68	32.44	30	25.47	252.2	.76	.12	1475.
40	0.68	32.44	40	25.47	252.4	1.01	.21	1475.
50	0.69	32.45	50	25.47	252.1	1.26	.32	1475.
60	0.69	32.45	60	25.48	252.0	1.51	.46	1475.
70	0.69	32.45	70	25.48	251.8	1.77	.63	1476.
80	0.69	32.46	80	25.49	251.4	2.02	.82	1476.
90	0.68	32.46	89	25.49	251.5	2.27	1.04	1476.
100	0.69	32.46	99	25.49	251.7	2.52	1.28	1476.
110	0.70	32.69	109	25.81	220.0	2.76	1.54	1472.
120	4.88	32.90	119	26.05	198.0	2.97	1.79	1470.
130	4.84	33.04	129	26.16	137.1	3.17	2.03	1470.
140	4.78	33.31	139	26.32	166.4	3.34	2.28	1470.
150	4.76	33.39	149	26.45	160.2	3.51	2.52	1470.
160	4.75	33.46	159	26.50	155.2	3.66	2.77	1471.
170	4.70	33.54	169	26.57	148.8	3.81	3.02	1471.
180	4.60	33.60	179	26.63	143.1	3.96	3.28	1470.
190	4.45	33.61	189	26.66	140.8	4.10	3.55	1470.
200	4.36	33.61	199	26.67	140.0	4.24	3.83	1470.
210	4.28	33.62	209	26.68	138.5	4.36	4.12	1470.
220	4.22	33.62	218	26.69	137.8	4.52	4.42	1470.
230	4.15	33.63	228	26.71	136.5	4.66	4.74	1469.
236	4.15	33.63	236	26.71	136.5	4.66	4.74	1469.
240	4.11	33.63	238	26.71	136.3	4.79	5.06	1469.
250	4.05	33.64	248	26.72	134.9	4.93	5.40	1469.
260	3.99	33.64	258	26.73	134.4	5.07	5.75	1469.
270	3.95	33.65	268	26.74	133.4	5.20	6.12	1469.
280	3.93	33.66	278	26.75	132.6	5.33	6.49	1469.
290	3.90	33.67	288	26.76	131.5	5.46	6.87	1469.
300	3.88	33.68	298	26.77	130.7	5.60	7.27	1469.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

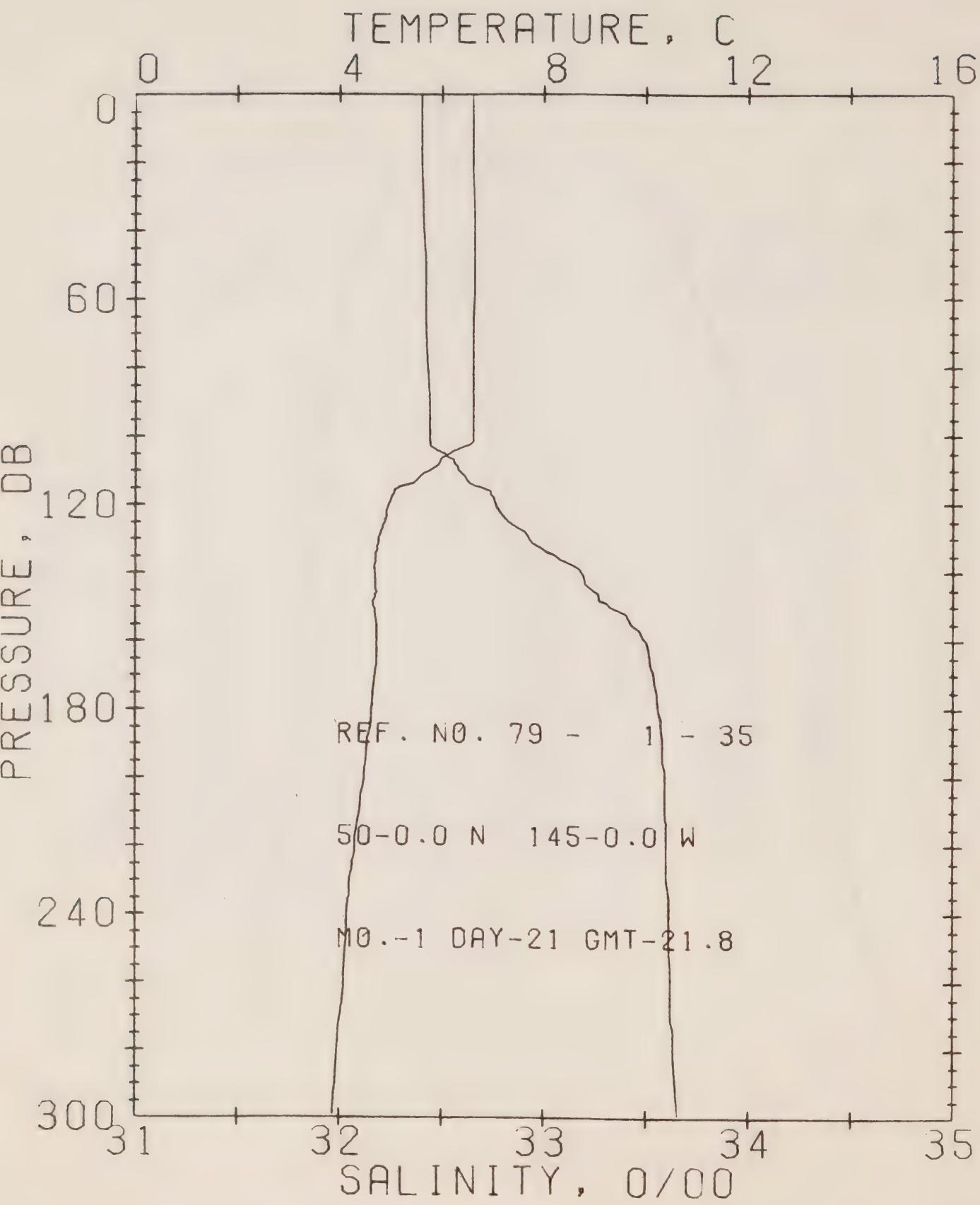
REFERENCE NO. 79-1-34 DATE 20/1/79

POSITION 50° .00N 145° .00E GMT 17.2 STATION P

RESULTS OF STP CAST 162 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.67	32.43	0	25.46	252.5	.00	.00	1474.
10	6.66	32.43	10	25.47	252.5	.25	.01	1474.
20	6.68	32.43	20	25.46	252.8	.51	.05	1475.
30	6.68	32.44	30	25.47	252.2	.76	.12	1475.
50	6.69	32.45	50	25.47	252.1	1.26	.32	1475.
75	6.69	32.46	75	25.49	251.4	1.89	.72	1476.
100	6.69	32.46	99	25.49	251.7	2.52	1.28	1476.
125	4.85	32.96	124	26.10	193.5	3.07	1.91	1470.
150	4.76	33.39	149	26.45	160.2	3.51	2.52	1470.
175	4.65	33.57	174	26.60	145.8	3.89	3.15	1471.
200	4.36	33.61	199	26.67	140.0	4.24	3.83	1470.
225	4.17	33.63	223	26.76	130.7	4.59	4.58	1469.
250	4.05	33.64	248	26.72	134.9	4.93	5.40	1469.
300	3.88	33.66	298	26.77	130.7	5.60	7.27	1469.
400	3.66	33.82	397	26.91	118.6	6.84	11.68	1470.
500	3.53	33.95	496	27.02	108.5	7.97	16.87	1472.
600	3.36	34.04	595	27.11	100.2	9.01	22.72	1473.
800	2.99	34.21	793	27.21	85.5	10.86	35.84	1475.
1000	2.63	34.35	990	27.42	72.5	12.44	50.27	1477.
1200	2.41	34.48	1188	27.54	61.6	13.78	65.32	1479.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79-1-35 DATE 21/1/79

POSITION 50° .0N, 145° .0W GMT 21.8 STATION P

RESULTS OF STP CAST 165 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.62	32.40	0	25.45	254.1	.00	.00	1474.
10	6.62	32.40	10	25.45	254.2	.25	.01	1474.
20	6.62	32.40	20	25.45	254.4	.51	.05	1474.
30	6.63	32.41	30	25.45	254.0	.76	.12	1475.
40	6.63	32.41	40	25.46	253.7	1.02	.21	1475.
50	6.63	32.42	50	25.46	253.4	1.27	.32	1475.
60	6.63	32.42	60	25.46	253.4	1.52	.47	1475.
70	6.62	32.42	70	25.47	253.2	1.78	.63	1475.
80	6.62	32.43	80	25.47	252.7	2.03	.83	1475.
90	6.62	32.44	89	25.48	252.2	2.28	1.05	1476.
100	6.61	32.44	99	25.48	252.2	2.53	1.29	1476.
110	5.79	32.58	109	25.69	232.0	2.78	1.55	1473.
120	4.96	32.76	119	25.93	209.1	3.00	1.81	1470.
130	4.75	32.93	129	26.09	174.4	3.20	2.06	1469.
140	4.69	33.18	139	26.29	175.1	3.38	2.32	1470.
150	4.65	33.32	149	26.41	164.3	3.55	2.57	1470.
160	4.71	33.50	159	26.54	151.6	3.71	2.82	1470.
170	4.69	33.53	169	26.57	148.9	3.86	3.07	1471.
180	4.62	33.56	179	26.60	146.4	4.01	3.33	1470.
190	4.54	33.58	189	26.63	144.0	4.15	3.61	1470.
200	4.48	33.59	199	26.64	142.7	4.30	3.89	1470.
210	4.37	33.59	209	26.65	141.7	4.44	4.19	1470.
220	4.30	33.60	218	26.67	140.2	4.58	4.50	1470.
230	4.20	33.60	228	26.68	139.3	4.72	4.82	1470.
240	4.14	33.61	238	26.69	138.0	4.86	5.15	1469.
250	4.11	33.61	248	26.69	137.8	5.00	5.49	1470.
260	4.08	33.62	258	26.70	136.8	5.13	5.85	1470.
270	4.01	33.62	268	26.71	136.1	5.27	6.22	1469.
280	3.95	33.63	278	26.73	134.8	5.41	6.60	1469.
290	3.90	33.64	288	26.74	133.6	5.54	6.99	1469.
300	3.87	33.65	298	26.75	132.5	5.67	7.39	1469.

TEMPERATURE, C

PRESSURE, DB

300

600

900

1200

1500

4

8

12

16

REF. NO. 79 - 1 - 35

50-0.0 N 145-0.0 W

MO.-1 DAY-21 GMT-21.8

SALINITY, 0/00

31

32

33

34

35

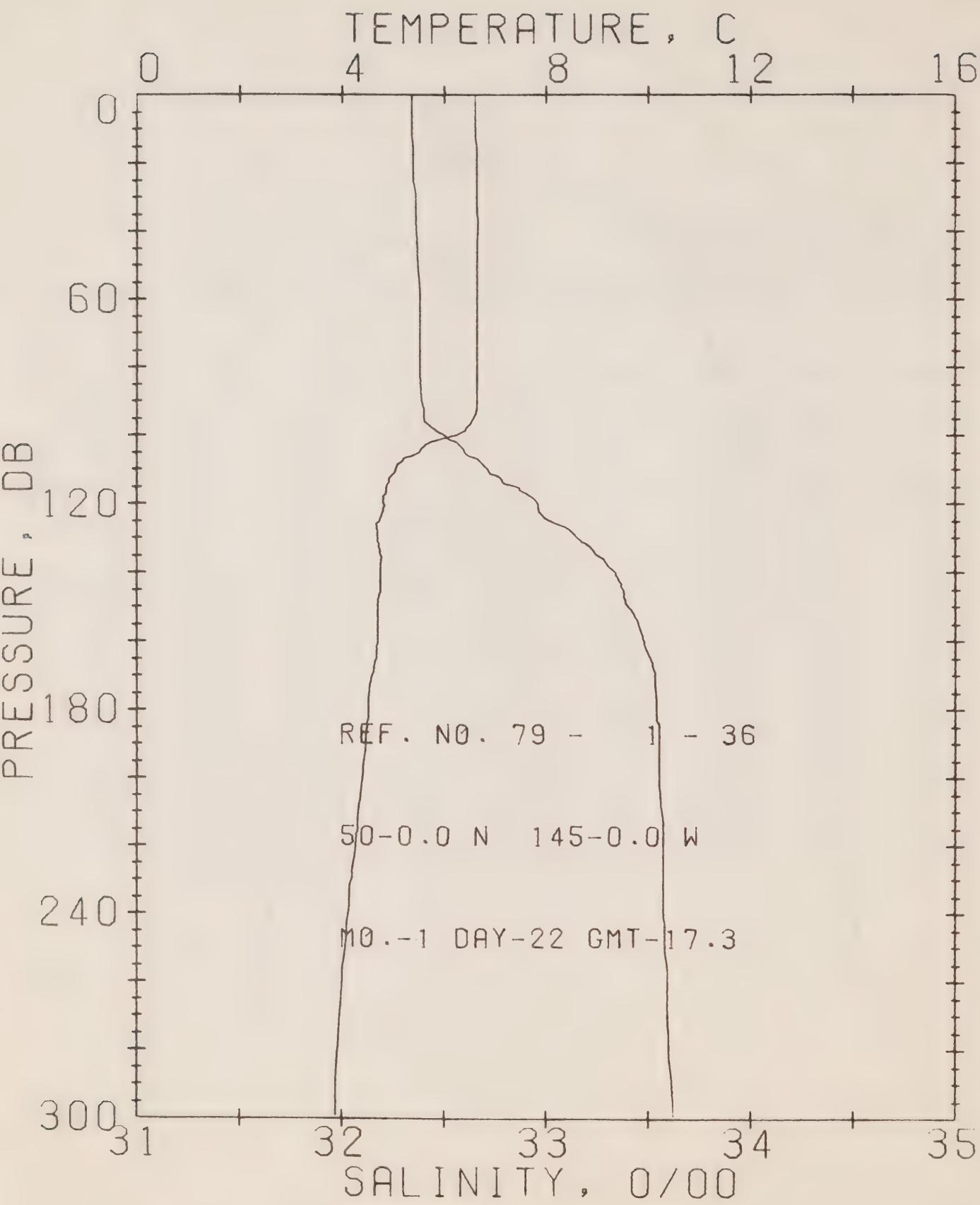
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 35 DATE 21/ 1/79

POSITION 50° .0N, 145° .0W GMT 21.8 STATION P

RESULTS OF STP CAST 190 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRSS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.62	32.40	0	25.45	254.1	.00	.00	1474.
10	6.62	32.40	10	25.45	254.2	.25	.01	1474.
20	6.62	32.40	20	25.45	254.4	.51	.05	1474.
30	6.63	32.41	30	25.45	254.0	.76	.12	1475.
50	6.63	32.42	50	25.46	253.4	1.27	.32	1475.
75	6.62	32.43	75	25.47	252.9	1.90	.73	1475.
100	6.61	32.44	99	25.48	252.2	2.53	1.29	1476.
125	4.88	32.83	124	25.99	203.2	3.10	1.94	1470.
150	4.65	33.32	149	26.41	164.3	3.55	2.57	1470.
175	4.65	33.55	174	26.59	147.3	3.94	3.20	1470.
200	4.48	33.59	199	26.64	142.7	4.30	3.89	1470.
225	4.24	33.60	223	26.67	139.7	4.65	4.66	1470.
250	4.11	33.61	248	26.69	137.8	5.00	5.49	1470.
300	3.87	33.65	298	26.75	132.5	5.67	7.39	1469.
400	3.60	33.80	397	26.89	120.1	6.93	11.88	1470.
500	3.51	33.93	496	27.00	109.8	8.08	17.14	1472.
600	3.31	34.03	595	27.11	100.6	9.13	23.02	1472.
800	2.94	34.16	793	27.24	88.5	11.03	36.47	1474.
1000	2.64	34.32	990	27.40	74.5	12.66	51.38	1477.
1200	2.37	34.46	1178	27.53	62.7	14.02	66.67	1479.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79-1-36

DATE 22/1/79

POSITION 50° .00' N 145° .00' E

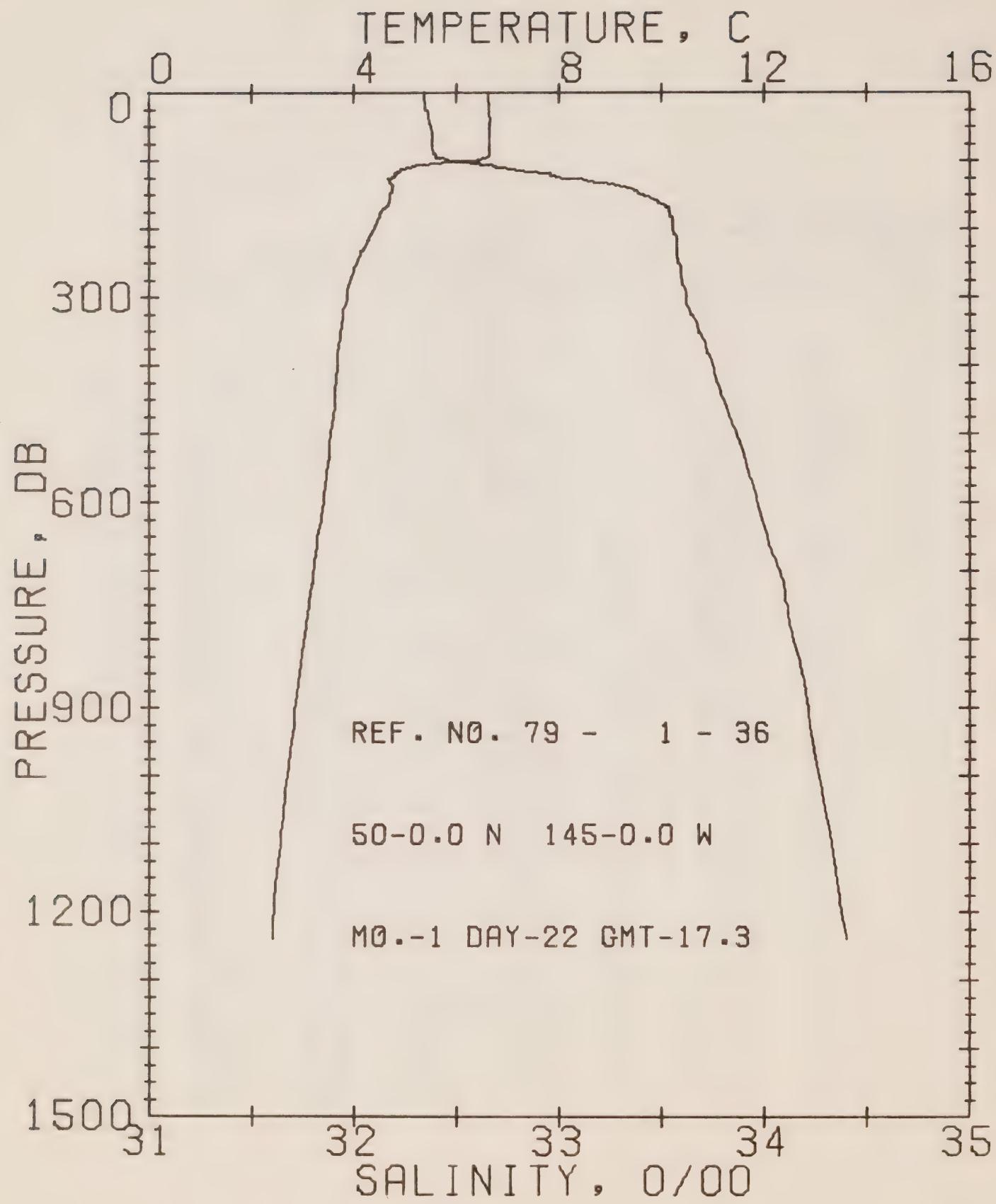
GMT 17.3

STATION P

RESULTS OF STP CAST 122 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.61	32.34	0	25.40	258.5	.00	.00	1474.
10	6.62	32.34	10	25.40	258.7	.26	.01	1474.
20	6.64	32.35	20	25.41	258.3	.52	.05	1474.
30	6.65	32.36	30	25.41	257.8	.78	.12	1475.
40	6.66	32.36	40	25.41	257.8	1.03	.21	1475.
50	6.65	32.37	50	25.42	257.1	1.29	.33	1475.
60	6.65	32.38	60	25.43	256.7	1.55	.47	1475.
70	6.65	32.38	70	25.43	256.8	1.80	.64	1475.
80	6.65	32.38	80	25.43	256.9	2.06	.84	1476.
90	6.65	32.39	90	25.44	256.3	2.32	1.06	1476.
100	6.24	32.50	99	25.57	243.2	2.57	1.31	1474.
110	5.04	32.71	109	25.88	213.8	2.80	1.55	1470.
120	4.81	32.90	119	26.10	192.7	3.00	1.79	1469.
130	4.70	33.15	129	26.27	177.1	3.19	2.02	1469.
140	4.75	33.34	139	26.41	163.8	3.36	2.26	1470.
150	4.70	33.40	149	26.47	158.5	3.52	2.49	1470.
160	4.69	33.48	159	26.53	152.8	3.67	2.74	1470.
170	4.59	33.55	169	26.58	148.1	3.82	2.99	1470.
180	4.51	33.54	179	26.60	146.6	3.97	3.26	1470.
190	4.46	33.55	189	26.61	145.4	4.12	3.53	1470.
200	4.38	33.55	199	26.62	144.7	4.26	3.82	1470.
210	4.31	33.56	209	26.64	142.9	4.40	4.12	1470.
220	4.25	33.57	218	26.65	141.9	4.55	4.43	1470.
230	4.18	33.57	228	26.65	141.3	4.69	4.76	1469.
240	4.11	33.57	238	26.66	140.7	4.83	5.09	1469.
250	4.05	33.58	248	26.68	139.4	4.97	5.44	1469.
260	4.00	33.59	258	26.69	138.2	5.11	5.80	1469.
270	3.95	33.59	268	26.69	137.8	5.25	6.18	1469.
280	3.91	33.60	278	26.71	136.7	5.38	6.56	1469.
290	3.88	33.61	288	26.72	135.6	5.52	6.96	1469.
300	3.86	33.62	298	26.73	134.9	5.65	7.36	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79-1-36 DATE 22/1/79

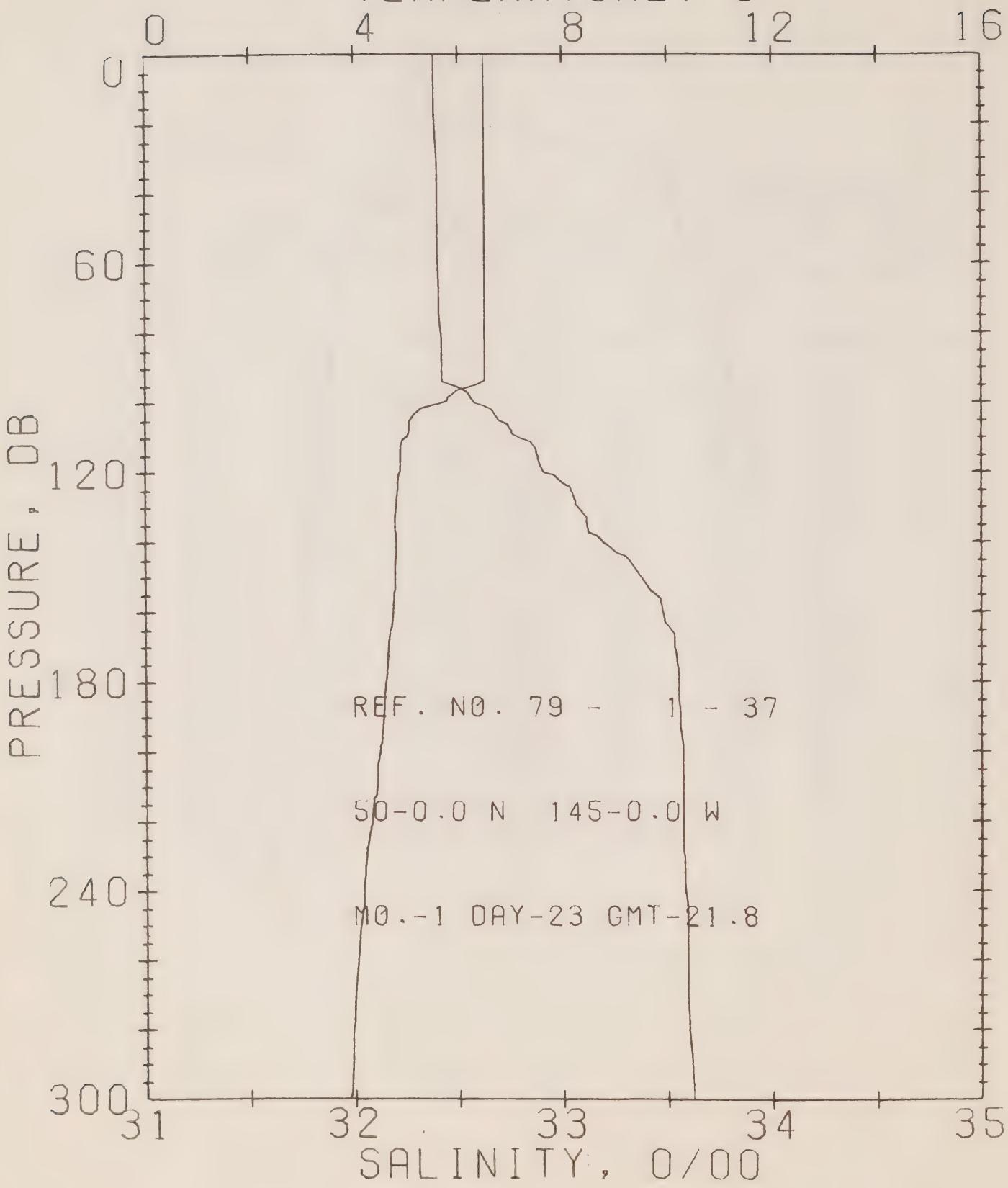
POSITION SU-0UN, 145-0W G.M.T 17.3 STATION P

RESULTS OF STP CAST 168 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.61	32.34	0	25.46	258.5	.00	.00	1474.
10	6.62	32.34	10	25.46	258.7	.26	.01	1474.
20	6.64	32.35	20	25.41	258.3	.52	.05	1474.
30	6.65	32.36	30	25.41	257.8	.78	.12	1475.
50	6.65	32.37	50	25.42	257.1	1.29	.33	1475.
75	6.65	32.38	75	25.43	256.9	1.93	.74	1475.
100	6.24	32.50	99	25.57	243.2	2.57	1.31	1474.
125	4.73	33.02	124	26.16	137.4	3.09	1.90	1469.
150	4.70	33.40	149	26.47	158.5	3.52	2.49	1470.
175	4.53	33.50	174	26.59	147.2	3.90	3.12	1470.
200	4.38	33.55	199	26.62	144.7	4.26	3.82	1470.
225	4.22	33.57	223	26.65	141.7	4.62	4.59	1470.
250	4.05	33.58	248	26.66	139.4	4.97	5.44	1469.
300	3.86	33.62	298	26.73	134.9	5.65	7.36	1469.
400	3.67	33.74	397	26.84	124.5	6.95	11.98	1470.
500	3.50	33.86	496	26.95	115.1	8.15	17.48	1472.
600	3.40	33.96	595	27.04	106.7	9.26	23.67	1473.
800	3.03	34.14	793	27.22	91.2	11.22	37.63	1475.
1000	2.69	34.26	990	27.35	79.4	12.92	53.15	1477.
1200	2.42	34.38	1188	27.46	69.1	14.39	69.67	1479.

TEMPERATURE, C



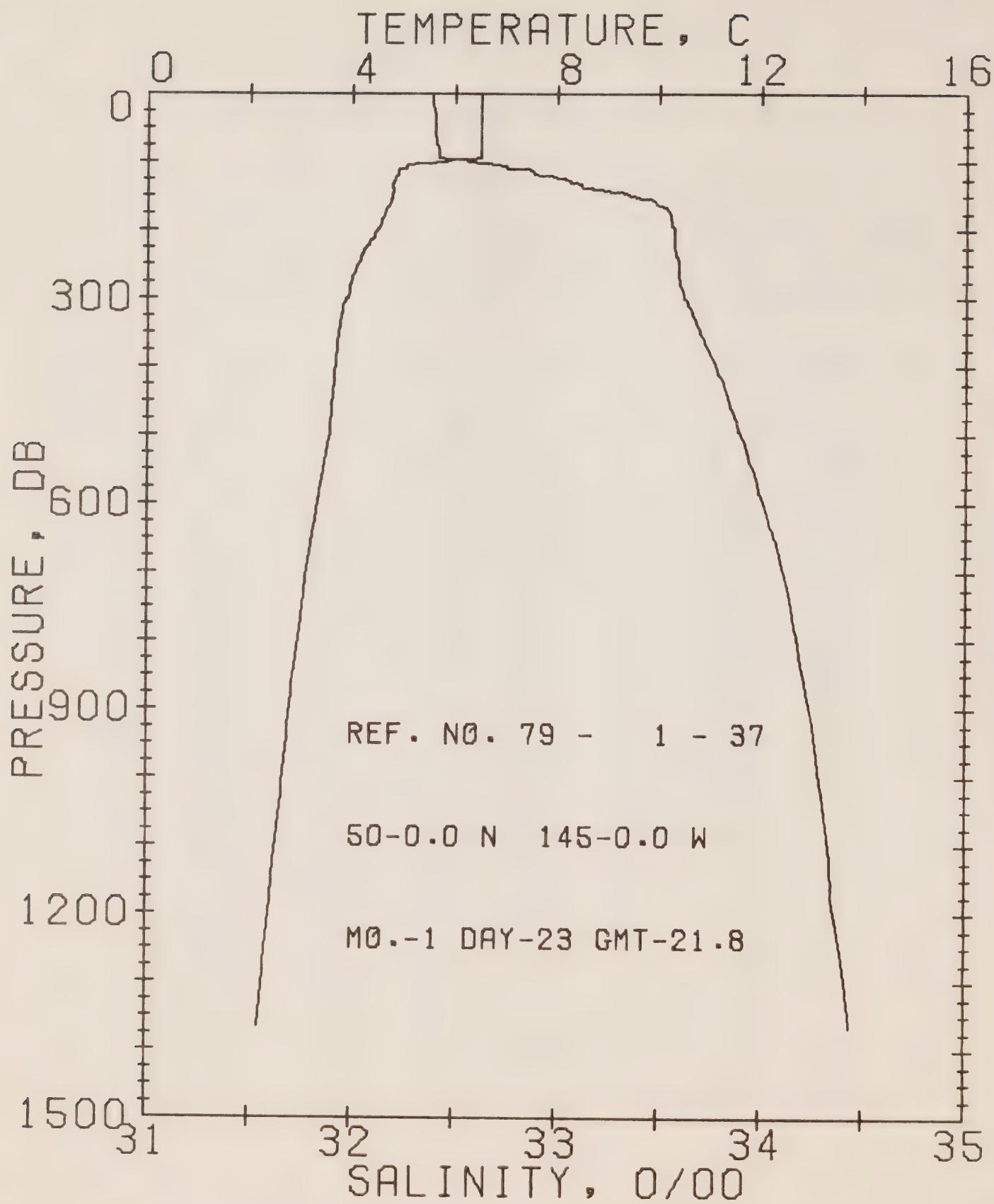
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79-1-37 DATE 23/1/79

POSITION 50° 00'N 145° 00'W GMT 21.8 STATION P

RESULTS OF STP CAST 163 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTAT D	POT. EN	SOUND
0	6.50	32.39	0	25.45	253.4	.00	.00	1474.
10	6.51	32.39	10	25.45	253.6	.25	.01	1474.
20	6.51	32.39	20	25.45	253.6	.51	.05	1474.
30	6.52	32.40	30	25.46	253.3	.76	.12	1474.
40	6.52	32.40	40	25.46	253.4	1.01	.21	1474.
50	6.52	32.40	50	25.46	253.5	1.27	.32	1475.
60	6.52	32.40	60	25.46	253.4	1.52	.47	1475.
70	6.52	32.41	70	25.47	253.0	1.77	.63	1475.
80	6.52	32.42	80	25.47	252.6	2.03	.83	1475.
90	6.52	32.42	90	25.48	252.5	2.28	1.04	1475.
100	5.76	32.57	99	25.69	232.3	2.52	1.28	1473.
110	5.00	32.79	109	25.95	207.4	2.74	1.51	1470.
120	4.88	32.91	119	26.06	197.2	2.94	1.75	1470.
130	4.80	33.07	129	26.19	184.5	3.13	1.99	1470.
140	4.79	33.19	139	26.24	175.4	3.31	2.23	1470.
150	4.77	33.38	149	26.44	161.3	3.48	2.48	1470.
160	4.74	33.48	159	26.52	153.4	3.63	2.73	1471.
170	4.64	33.53	169	26.57	148.7	3.78	2.98	1470.
180	4.59	33.55	179	26.59	146.8	3.93	3.25	1470.
190	4.55	33.56	189	26.61	145.6	4.08	3.52	1470.
200	4.49	33.57	199	26.62	144.3	4.22	3.81	1470.
210	4.42	33.57	209	26.63	143.7	4.37	4.11	1470.
220	4.32	33.57	218	26.64	142.7	4.51	4.42	1470.
230	4.21	33.58	228	26.66	141.2	4.65	4.75	1470.
240	4.16	33.56	238	26.67	140.2	4.79	5.09	1470.
250	4.10	33.59	248	26.68	139.2	4.93	5.44	1469.
260	4.05	33.59	258	26.68	138.7	5.07	5.80	1469.
270	4.00	33.59	264	26.69	138.2	5.21	6.17	1469.
280	3.95	33.60	276	26.70	137.1	5.35	6.56	1469.
290	3.94	33.61	286	26.71	136.3	5.48	6.95	1469.
300	3.89	33.62	298	26.72	135.2	5.62	7.36	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 37 DATE 23/ 1/79

POSITION 50° .0N, 145° .0W GMT 21.8 STATION P

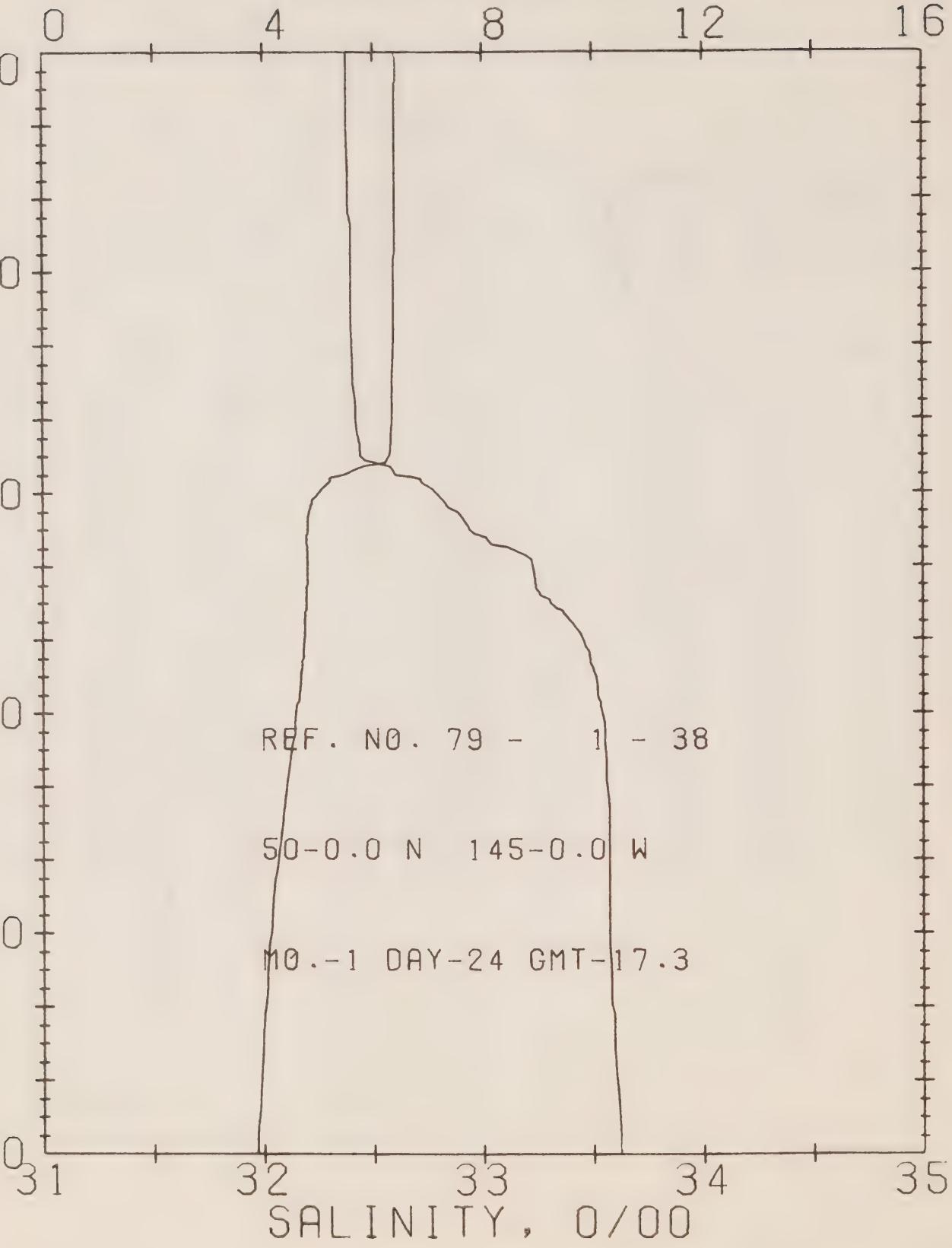
RESULTS OF STP CAST 100 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.50	32.39	0	25.45	253.4	.00	.00	1474.
10	6.51	32.39	10	25.45	253.6	.25	.01	1474.
20	6.51	32.39	20	25.45	253.6	.51	.05	1474.
30	6.52	32.40	30	25.46	253.3	.76	.12	1474.
50	6.52	32.40	50	25.46	253.5	1.27	.32	1475.
75	6.52	32.41	75	25.47	253.0	1.90	.73	1475.
100	6.76	32.57	99	25.69	232.3	2.52	1.28	1473.
125	4.82	33.04	124	26.17	186.9	3.04	1.87	1470.
150	4.77	33.38	149	26.44	161.3	3.48	2.48	1470.
175	4.61	33.55	174	26.59	147.2	3.86	3.11	1470.
200	4.49	33.57	199	26.62	144.3	4.22	3.81	1470.
225	4.26	33.57	223	26.65	142.1	4.58	4.58	1470.
250	4.10	33.59	248	26.68	139.2	4.93	5.43	1469.
300	3.89	33.62	298	26.72	135.2	5.62	7.36	1469.
400	3.67	33.78	397	26.87	121.8	6.90	11.92	1470.
500	3.55	33.90	496	26.98	112.2	8.07	17.27	1472.
600	3.33	34.01	595	27.09	102.5	9.14	23.27	1472.
800	2.94	34.17	793	27.25	97.6	11.03	36.68	1474.
1000	2.66	34.29	990	27.37	97.4	12.67	51.71	1477.
1200	2.39	34.36	1168	27.45	69.9	14.13	68.12	1479.

TEMPERATURE, C

PRESSURE, DB



OFFSHORE OCEANOGRAPHY GROUP

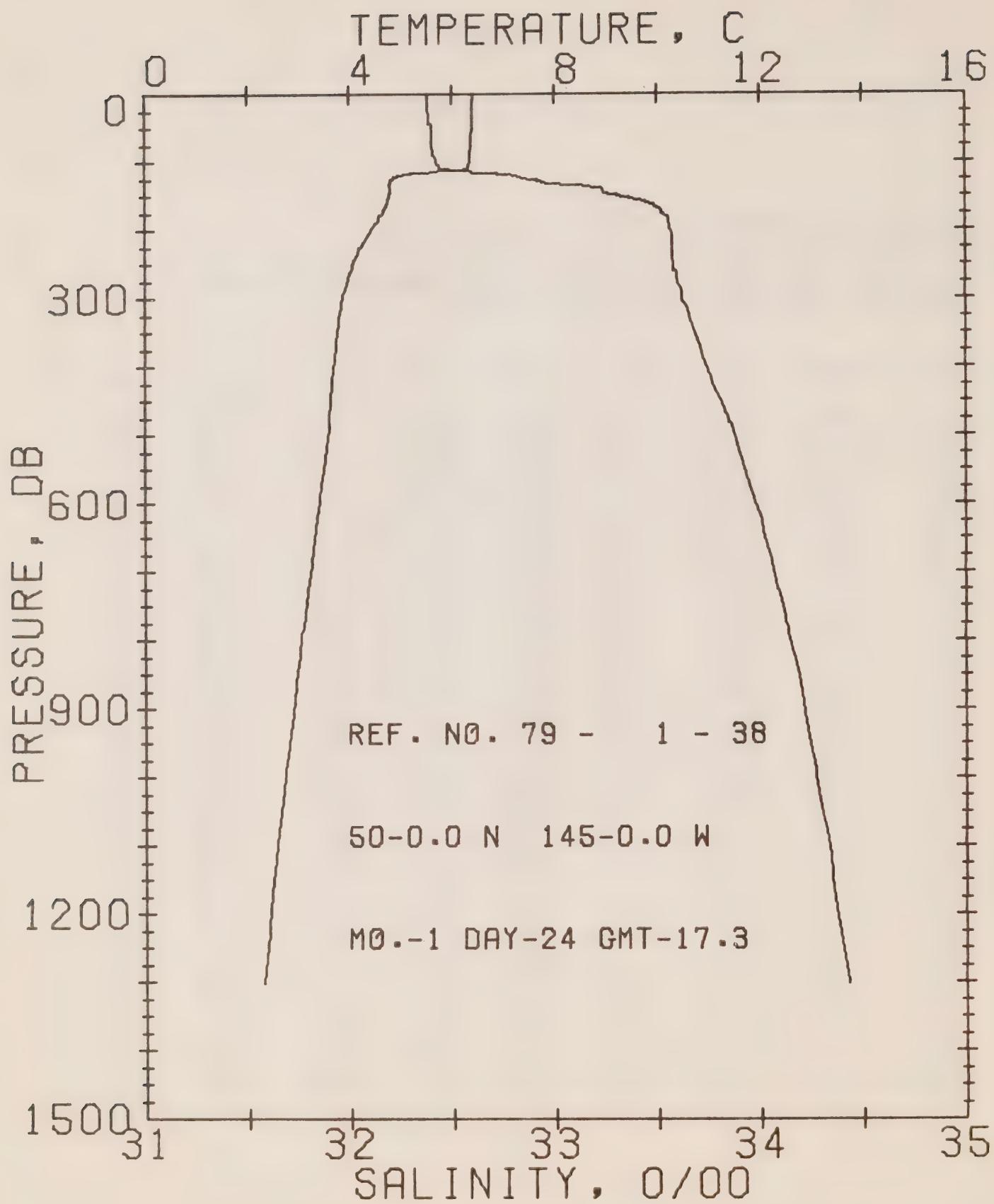
REFERENCE NO. 79- 1- 38

DATE 24/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 100 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.39	32.38	0	25.46	252.8	.00	.00	1473.
10	6.40	32.38	10	25.46	253.1	.25	.01	1473.
20	6.40	32.38	20	25.46	253.2	.51	.05	1474.
30	6.40	32.39	30	25.47	252.8	.76	.12	1474.
40	6.40	32.39	40	25.47	252.7	1.01	.21	1474.
50	6.39	32.40	50	25.48	251.9	1.26	.32	1474.
60	6.37	32.40	60	25.48	251.8	1.52	.46	1474.
70	6.38	32.40	70	25.48	252.0	1.77	.63	1474.
80	6.37	32.40	80	25.48	251.8	2.02	.82	1474.
90	6.36	32.41	89	25.49	251.2	2.27	1.04	1475.
100	6.34	32.42	99	25.50	250.4	2.52	1.28	1475.
110	6.30	32.44	109	25.52	248.5	2.77	1.55	1475.
120	5.02	32.78	119	25.94	208.1	3.00	1.81	1470.
130	4.81	32.94	129	26.09	194.3	3.20	2.07	1470.
140	4.80	33.22	139	26.32	172.9	3.38	2.32	1470.
150	4.78	33.31	149	26.38	166.4	3.55	2.57	1470.
160	4.73	33.46	159	26.51	155.0	3.71	2.82	1470.
170	4.68	33.51	169	26.55	150.6	3.86	3.08	1470.
180	4.58	33.54	179	26.59	147.5	4.01	3.35	1470.
190	4.50	33.55	189	26.61	145.6	4.16	3.62	1470.
200	4.42	33.56	199	26.62	144.1	4.30	3.91	1470.
210	4.33	33.57	209	26.64	142.7	4.45	4.21	1470.
220	4.26	33.57	218	26.65	142.1	4.59	4.52	1470.
230	4.16	33.57	228	26.66	141.1	4.73	4.85	1469.
240	4.11	33.57	238	26.66	140.7	4.87	5.18	1469.
250	4.06	33.58	248	26.67	139.7	5.01	5.54	1469.
260	4.01	33.58	258	26.68	138.8	5.15	5.90	1469.
270	3.97	33.59	268	26.69	138.0	5.29	6.27	1469.
280	3.94	33.60	278	26.71	136.8	5.43	6.66	1469.
290	3.89	33.61	288	26.72	135.5	5.56	7.05	1469.
300	3.86	33.62	298	26.73	134.9	5.70	7.46	1469.

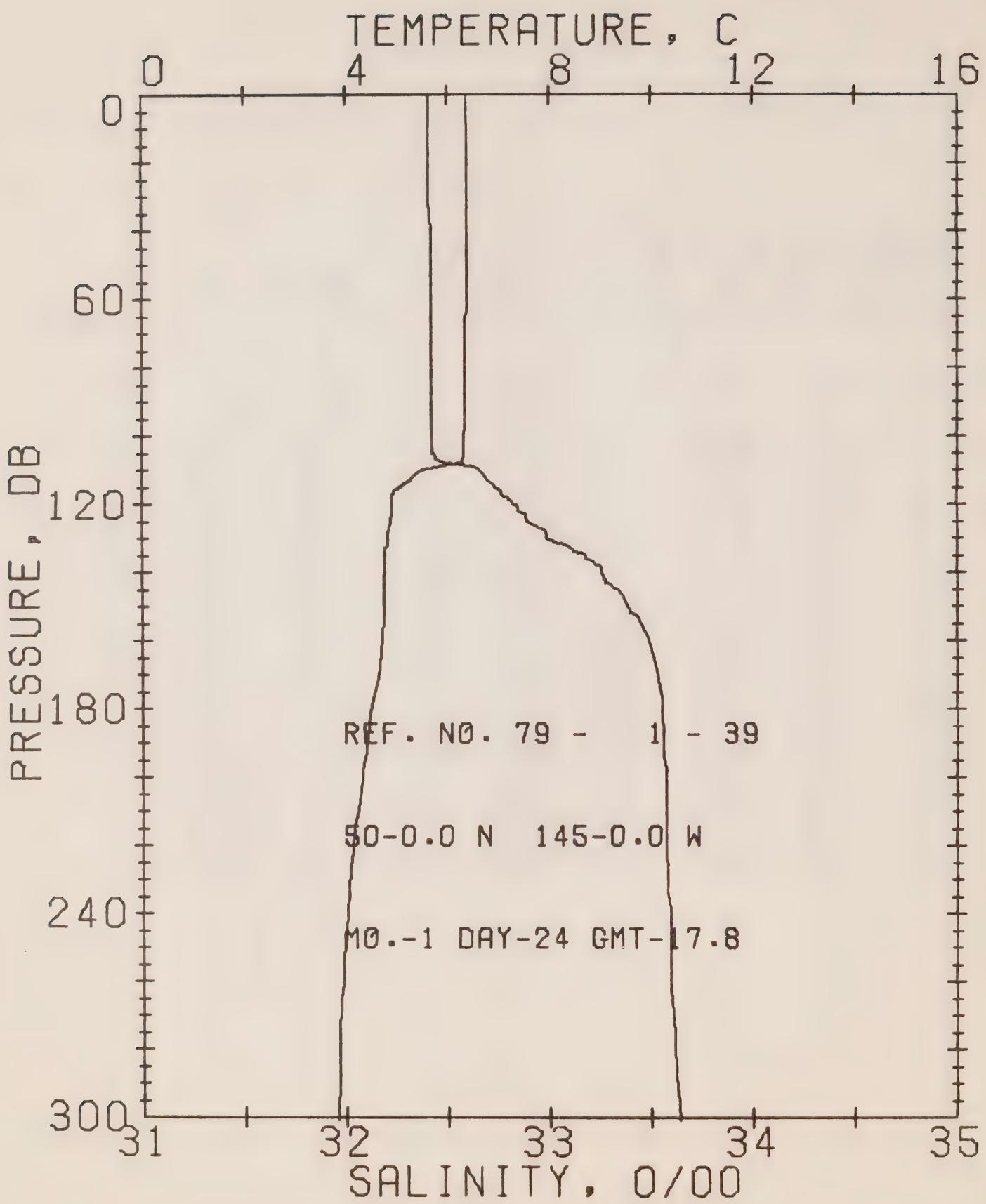


OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 38 DATE 24/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P
RESULTS OF STP CAST 150 POINTS TAKEN FROM ANALOG TRACE
GUILDLINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.39	32.38	0	25.46	252.8	.00	.00	1473.
10	6.40	32.38	10	25.46	253.1	.25	.01	1473.
20	6.40	32.38	20	25.46	253.2	.51	.05	1474.
30	6.40	32.39	30	25.47	252.8	.76	.12	1474.
50	6.39	32.40	50	25.48	251.9	1.26	.32	1474.
75	6.38	32.40	75	25.48	252.1	1.89	.72	1474.
100	6.34	32.42	99	25.50	250.4	2.52	1.28	1475.
125	4.82	32.89	124	20.05	198.1	3.10	1.94	1469.
150	4.78	33.31	149	26.38	166.4	3.55	2.57	1470.
175	4.64	33.52	174	26.57	149.5	3.94	3.21	1470.
200	4.42	33.56	199	26.62	144.1	4.30	3.91	1470.
225	4.20	33.57	223	26.65	141.5	4.66	4.68	1469.
250	4.06	33.58	248	26.67	139.7	5.01	5.53	1469.
300	3.86	33.62	298	26.73	134.9	5.70	7.46	1469.
400	3.68	33.74	397	26.84	125.1	7.00	12.08	1470.
500	3.57	33.87	496	26.96	114.4	8.19	17.56	1472.
600	3.40	33.98	595	27.06	105.5	9.30	23.73	1473.
800	3.04	34.14	793	27.22	91.1	11.26	37.70	1475.
1000	2.72	34.27	990	27.35	79.1	12.96	53.22	1477.
1200	2.43	34.37	1188	27.46	69.5	14.43	69.75	1479.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 39

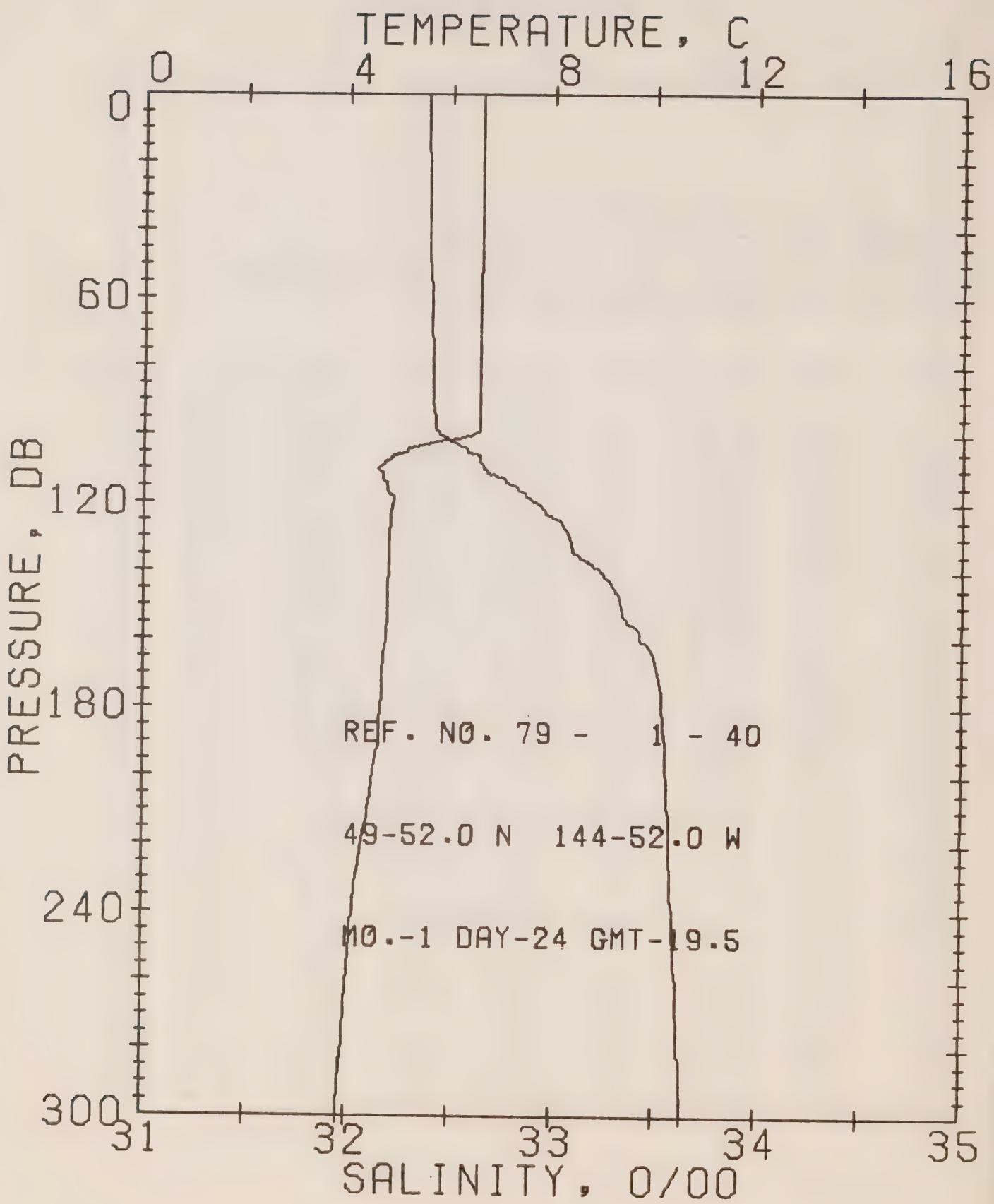
DATE 24/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.8 STATION P

RESULTS OF STP CAST 92 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.37	32.41	0	25.49	250.3	.00	.00	1473.
10	6.39	32.41	10	25.48	250.7	.25	.01	1473.
20	6.39	32.41	20	25.48	250.8	.50	.05	1474.
30	6.39	32.41	30	25.48	250.9	.75	.12	1474.
40	6.40	32.42	40	25.49	250.5	1.00	.20	1474.
50	6.39	32.42	50	25.49	250.4	1.25	.32	1474.
60	6.40	32.42	60	25.49	250.6	1.50	.46	1474.
70	6.35	32.42	70	25.50	250.2	1.75	.63	1474.
80	6.34	32.42	80	25.50	250.2	2.00	.82	1474.
90	6.34	32.42	89	25.50	250.3	2.25	1.03	1474.
100	6.33	32.42	99	25.50	250.3	2.50	1.28	1475.
110	5.49	32.65	109	25.78	223.3	2.75	1.54	1472.
120	4.90	32.82	119	25.98	204.2	2.96	1.79	1470.
130	4.82	32.99	129	26.13	190.7	3.16	2.04	1470.
140	4.77	33.25	139	26.34	170.7	3.34	2.29	1470.
150	4.75	33.38	149	26.45	160.6	3.50	2.53	1470.
160	4.70	33.48	159	26.53	152.6	3.66	2.78	1470.
170	4.65	33.53	169	26.57	148.9	3.81	3.03	1470.
180	4.50	33.55	179	26.61	145.8	3.96	3.29	1470.
190	4.42	33.56	189	26.62	144.3	4.10	3.56	1470.
200	4.33	33.57	199	26.64	142.7	4.25	3.85	1470.
210	4.23	33.57	209	26.65	141.7	4.39	4.15	1469.
220	4.14	33.57	218	26.66	140.8	4.53	4.46	1469.
230	4.07	33.58	228	26.67	139.5	4.67	4.78	1469.
240	4.02	33.59	238	26.69	138.3	4.81	5.11	1469.
250	3.97	33.59	248	26.69	137.9	4.95	5.46	1469.
260	3.94	33.59	258	26.69	137.6	5.09	5.81	1469.
270	3.89	33.60	268	26.71	136.1	5.22	6.18	1469.
280	3.88	33.61	278	26.72	135.5	5.36	6.56	1469.
290	3.85	33.62	288	26.73	134.4	5.49	6.96	1469.
300	3.83	33.64	298	26.74	133.2	5.63	7.36	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 40

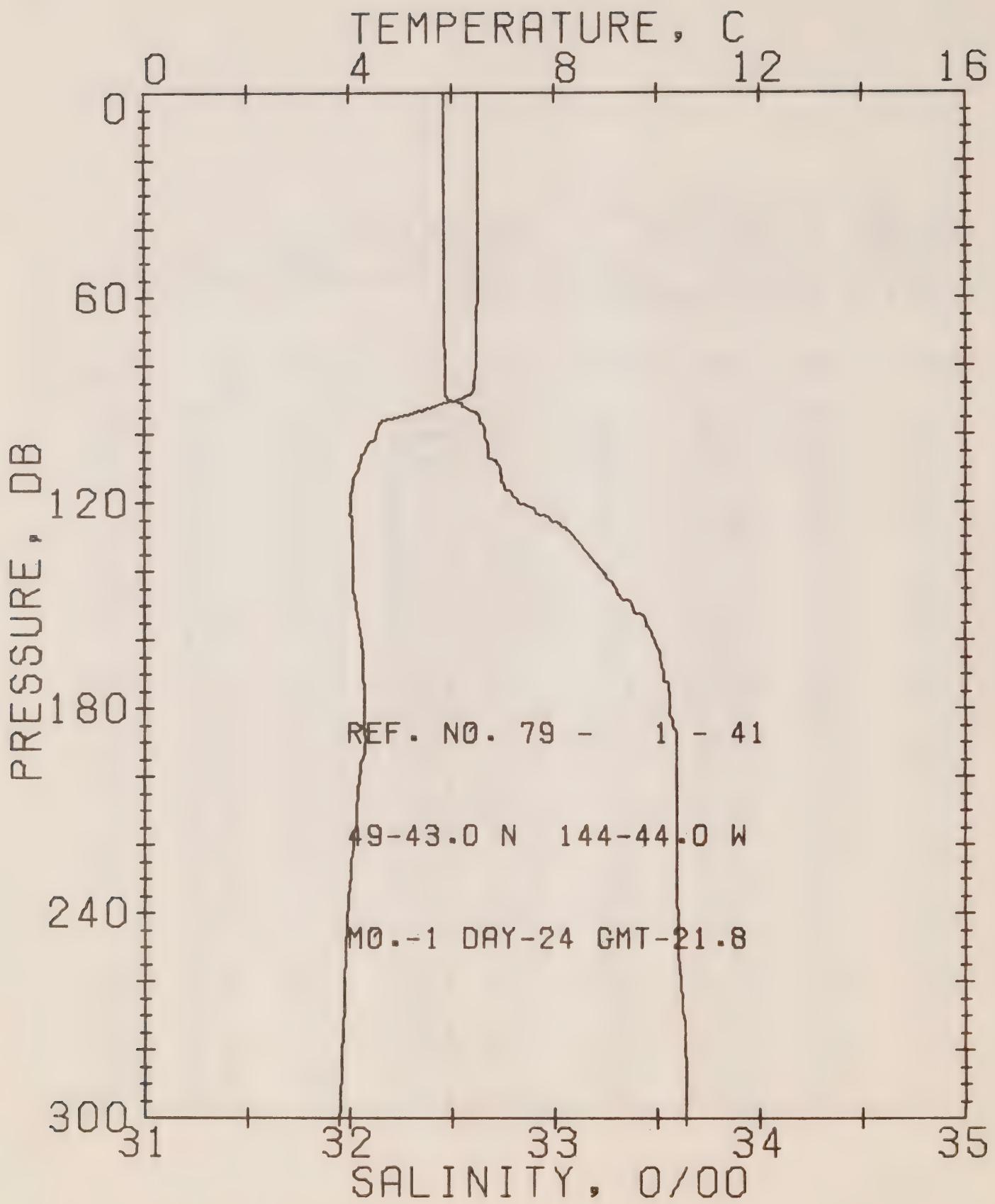
DATE 24/ 1/79

POSITION 49-52.0N, 144-52.0W GMT 19.5 STATION E3

RESULTS OF STP CAST 97 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.58	32.38	0	25.44	255.1	.00	.00	1474.
10	6.58	32.38	10	25.44	255.2	.26	.01	1474.
20	6.58	32.39	20	25.44	254.7	.51	.05	1474.
30	6.58	32.39	30	25.44	254.7	.76	.12	1474.
40	6.58	32.39	40	25.44	254.9	1.02	.21	1475.
50	6.58	32.39	50	25.45	254.7	1.27	.32	1475.
60	6.57	32.40	60	25.45	254.2	1.53	.47	1475.
70	6.57	32.40	70	25.46	254.1	1.78	.64	1475.
80	6.57	32.41	80	25.46	253.7	2.04	.83	1475.
90	6.57	32.41	89	25.46	253.8	2.29	1.05	1475.
100	6.44	32.45	99	25.51	249.4	2.54	1.29	1475.
110	4.58	32.66	109	25.89	212.7	2.77	1.54	1468.
120	4.87	32.91	119	26.06	196.7	2.97	1.78	1470.
130	4.81	33.08	129	26.20	183.8	3.16	2.02	1470.
140	4.79	33.23	139	26.32	172.5	3.34	2.26	1470.
150	4.77	33.33	149	26.40	164.8	3.51	2.51	1470.
160	4.74	33.43	159	26.48	157.1	3.67	2.77	1470.
170	4.68	33.51	169	26.55	150.6	3.82	3.02	1470.
180	4.63	33.53	179	26.58	148.6	3.97	3.29	1470.
190	4.60	33.55	189	26.59	147.1	4.12	3.57	1471.
200	4.50	33.55	199	26.61	145.6	4.27	3.86	1470.
210	4.39	33.56	209	26.63	143.9	4.41	4.16	1470.
220	4.27	33.57	218	26.65	142.2	4.56	4.47	1470.
230	4.17	33.58	228	26.66	140.5	4.70	4.80	1469.
240	4.13	33.59	238	26.68	139.4	4.84	5.13	1469.
250	4.06	33.60	248	26.69	138.3	4.98	5.48	1469.
260	4.00	33.61	258	26.70	136.9	5.11	5.84	1469.
270	3.96	33.61	268	26.71	136.2	5.25	6.21	1469.
280	3.94	33.62	278	26.72	135.5	5.39	6.59	1469.
290	3.88	33.63	288	26.73	134.3	5.52	6.98	1469.
300	3.84	33.64	298	26.74	133.1	5.65	7.38	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 41

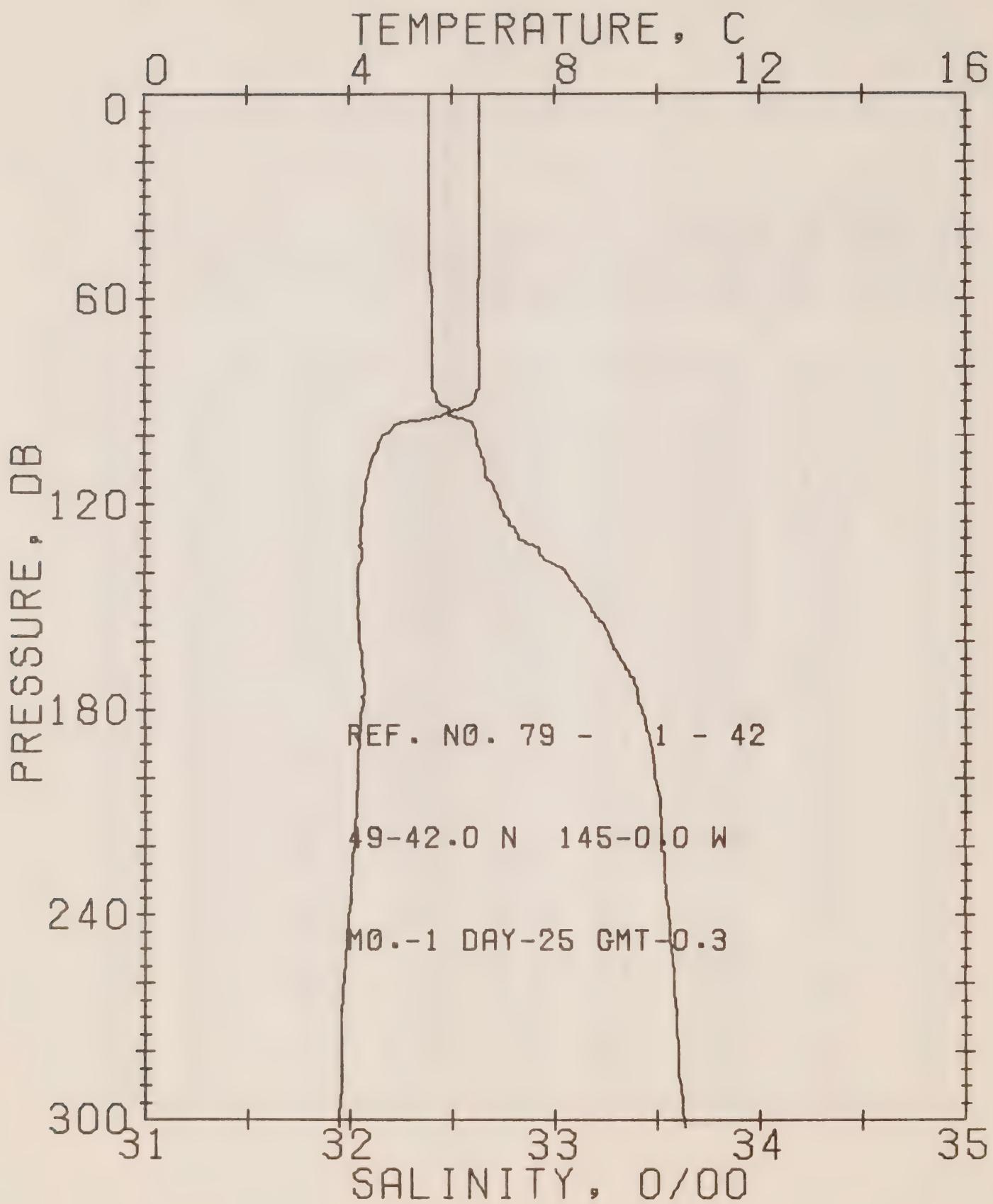
DATE 24/ 1/79

POSITION 49-43.0N, 144-44.0W GMT 21.8 STATION E4

RESULTS OF STP CAST 151 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.50	32.46	0	25.51	248.2	.00	.00	1474.
10	6.51	32.46	10	25.51	248.4	.25	.01	1474.
20	6.51	32.46	20	25.51	248.5	.50	.05	1474.
30	6.51	32.46	30	25.51	248.6	.75	.11	1474.
40	6.51	32.46	40	25.51	248.8	.99	.20	1474.
50	6.52	32.46	50	25.51	249.0	1.24	.32	1475.
60	6.50	32.46	60	25.51	248.9	1.49	.46	1475.
70	6.48	32.46	70	25.51	248.8	1.74	.62	1475.
80	6.47	32.47	80	25.52	248.0	1.99	.81	1475.
90	6.13	32.48	89	25.57	243.2	2.24	1.03	1474.
100	4.51	32.66	99	25.90	212.0	2.46	1.24	1468.
110	4.18	32.73	109	25.99	203.4	2.67	1.46	1466.
120	4.02	32.82	119	26.08	195.2	2.87	1.70	1466.
130	4.05	33.09	129	26.29	175.0	3.05	1.93	1467.
140	4.08	33.22	139	26.39	165.5	3.22	2.17	1467.
150	4.13	33.37	149	26.50	154.9	3.38	2.40	1468.
160	4.22	33.48	159	26.58	147.8	3.53	2.64	1468.
170	4.28	33.53	169	26.61	144.9	3.68	2.89	1469.
180	4.30	33.56	179	26.63	142.9	3.82	3.14	1469.
190	4.31	33.59	189	26.66	140.8	3.96	3.41	1469.
200	4.20	33.59	199	26.67	139.8	4.10	3.69	1469.
210	4.12	33.59	209	26.68	139.1	4.24	3.98	1469.
220	4.07	33.59	218	26.68	138.6	4.38	4.28	1469.
230	4.02	33.59	228	26.69	138.2	4.52	4.60	1469.
240	3.96	33.60	238	26.70	137.1	4.66	4.93	1469.
250	3.92	33.60	248	26.70	136.6	4.79	5.27	1469.
260	3.90	33.61	258	26.71	135.7	4.93	5.63	1469.
270	3.89	33.62	268	26.73	134.7	5.07	5.99	1469.
280	3.85	33.63	278	26.74	133.7	5.20	6.37	1469.
290	3.83	33.64	288	26.75	133.0	5.33	6.76	1469.
300	3.78	33.64	298	26.75	132.6	5.47	7.15	1469.



OFFSHORE OCEANOGRAPHY GROUP

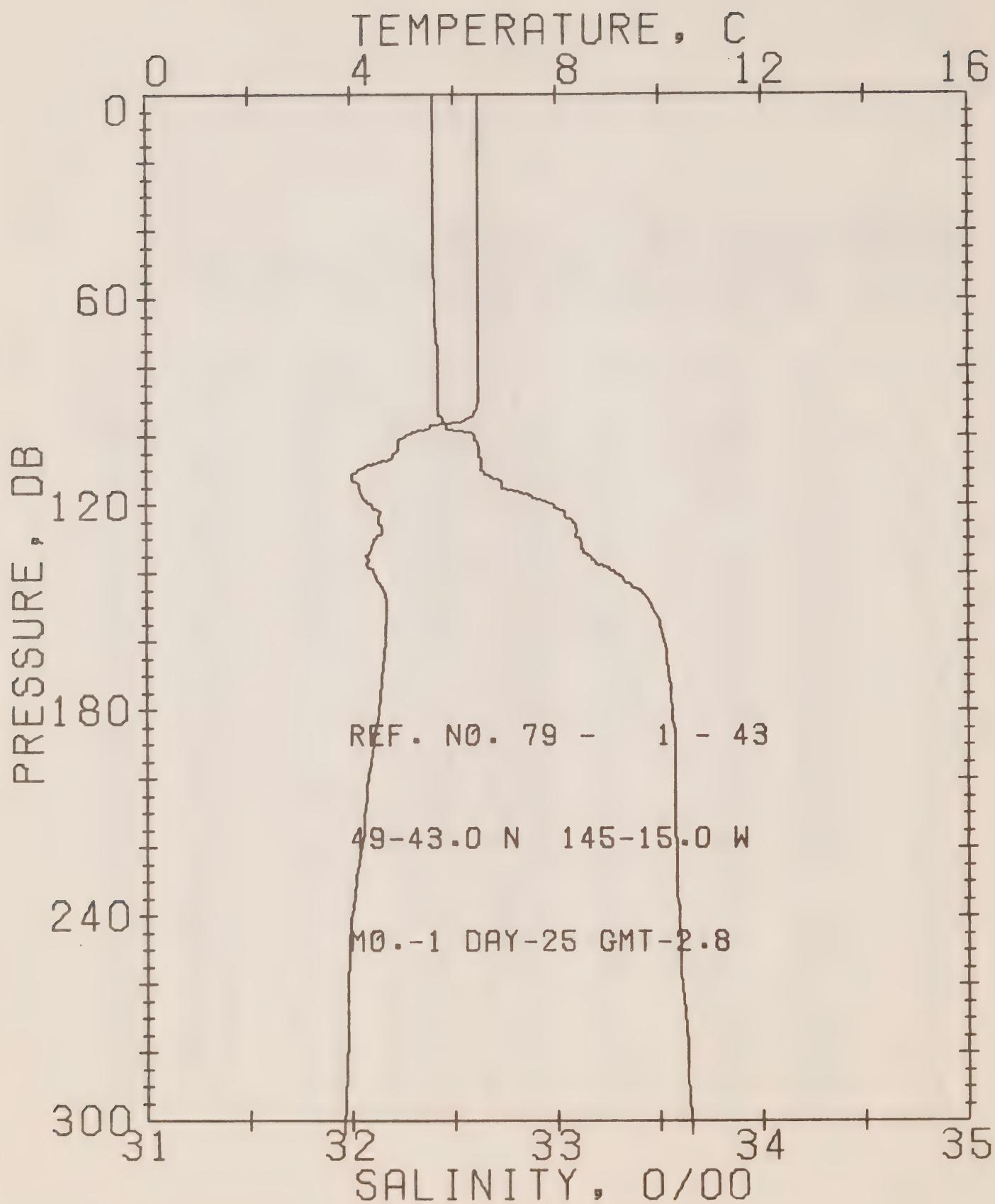
REFERENCE NO. 79- 1- 42 DATE 25/ 1/79

POSITION 49-42.0N, 145- .0W GMT .3 STATION C1

RESULTS OF STP CAST 131 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DLPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.54	32.39	0	25.45	253.9	.00	.00	1474.
10	6.54	32.39	10	25.45	254.0	.25	.01	1474.
20	6.54	32.39	20	25.45	254.1	.51	.05	1474.
30	6.54	32.39	30	25.45	254.2	.76	.12	1474.
40	6.54	32.39	40	25.45	254.4	1.02	.21	1474.
50	6.53	32.39	50	25.45	254.4	1.27	.32	1475.
60	6.52	32.40	60	25.46	253.6	1.52	.47	1475.
70	6.52	32.40	70	25.46	253.7	1.78	.63	1475.
80	6.53	32.40	80	25.46	254.0	2.03	.83	1475.
90	6.41	32.43	99	25.50	250.4	2.29	1.05	1475.
100	4.64	32.61	99	25.85	217.0	2.52	1.27	1468.
110	4.37	32.66	109	25.91	210.6	2.73	1.50	1467.
120	4.26	32.73	119	25.98	204.3	2.94	1.74	1467.
130	4.21	32.83	129	26.07	196.3	3.14	2.00	1467.
140	4.17	33.05	139	26.24	179.5	3.33	2.26	1467.
150	4.17	33.17	149	26.34	170.6	3.50	2.52	1468.
160	4.20	33.28	159	26.42	163.0	3.67	2.78	1468.
170	4.24	33.37	169	26.49	156.5	3.83	3.05	1468.
180	4.23	33.43	179	26.54	151.9	3.98	3.32	1469.
190	4.18	33.47	189	26.57	148.7	4.13	3.61	1469.
200	4.16	33.49	199	26.59	146.9	4.28	3.90	1469.
210	4.12	33.51	209	26.61	145.1	4.43	4.20	1469.
220	4.09	33.52	218	26.62	144.0	4.57	4.52	1469.
230	4.03	33.53	228	26.64	142.6	4.71	4.85	1469.
240	3.98	33.55	238	26.66	140.9	4.85	5.19	1469.
250	3.93	33.56	248	26.68	139.3	4.99	5.54	1469.
260	3.89	33.58	258	26.69	137.9	5.13	5.90	1469.
270	3.85	33.59	268	26.70	136.8	5.27	6.27	1469.
280	3.84	33.60	278	26.71	136.2	5.41	6.65	1469.
290	3.83	33.61	288	26.72	135.3	5.54	7.05	1469.
300	3.79	33.62	298	26.74	133.8	5.68	7.45	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 43

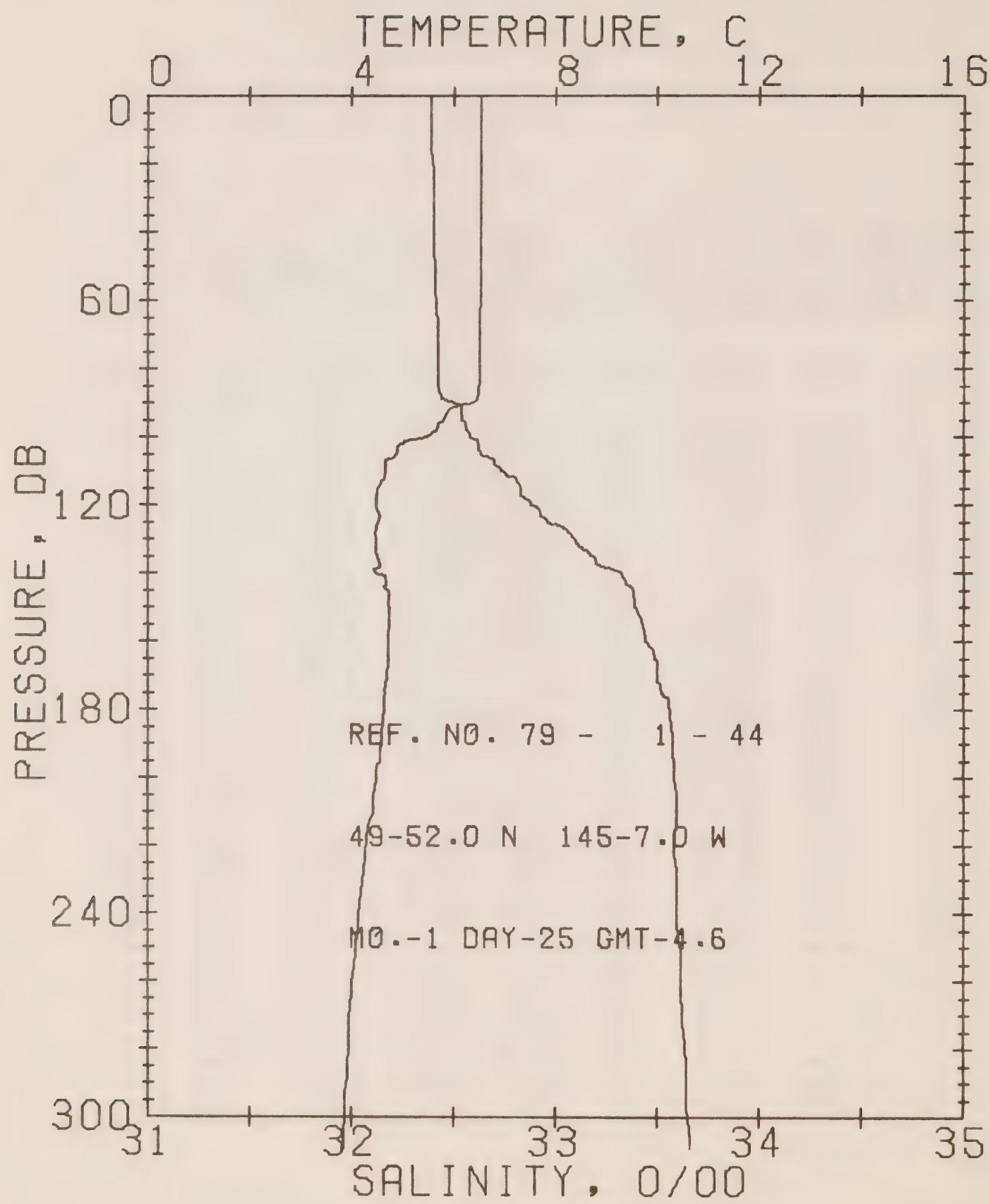
DATE 25/ 1/79

POSITION 49-43.0N, 145-15.0W GM1 2.8 STATION W4

RESULTS OF STP CAST 116 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.47	32.40	0	25.47	252.3	.00	.00	1474.
10	6.47	32.40	10	25.47	252.4	.25	.01	1474.
20	6.47	32.40	20	25.47	252.5	.50	.05	1474.
30	6.48	32.40	30	25.47	252.8	.76	.12	1474.
40	6.48	32.40	40	25.47	252.9	1.01	.21	1474.
50	6.48	32.40	50	25.47	252.8	1.26	.32	1474.
60	6.48	32.41	60	25.47	252.5	1.52	.46	1475.
70	6.48	32.41	70	25.48	252.2	1.77	.63	1475.
80	6.48	32.42	80	25.48	251.9	2.02	.82	1475.
90	6.47	32.42	89	25.48	251.8	2.27	1.04	1475.
100	5.06	32.60	99	25.79	222.2	2.52	1.28	1470.
110	4.14	32.63	109	25.91	210.5	2.73	1.51	1466.
120	4.41	32.99	119	26.17	186.3	2.93	1.74	1468.
130	4.45	33.11	129	26.26	177.8	3.11	1.98	1468.
140	4.46	33.29	139	26.40	164.5	3.29	2.21	1469.
150	4.70	33.46	149	26.51	154.4	3.45	2.45	1470.
160	4.67	33.52	159	26.56	149.6	3.60	2.69	1470.
170	4.59	33.54	169	26.59	147.4	3.75	2.94	1470.
180	4.54	33.56	179	26.61	145.4	3.89	3.20	1470.
190	4.42	33.57	189	26.63	143.5	4.04	3.47	1470.
200	4.31	33.57	199	26.64	142.5	4.18	3.75	1470.
210	4.25	33.57	209	26.65	141.9	4.32	4.05	1469.
220	4.18	33.58	218	26.66	140.6	4.46	4.36	1469.
230	4.06	33.58	228	26.67	139.4	4.60	4.68	1469.
240	3.99	33.59	238	26.69	138.0	4.74	5.01	1469.
250	3.96	33.60	248	26.70	137.0	4.88	5.36	1469.
260	3.92	33.61	258	26.71	136.3	5.02	5.71	1469.
270	3.91	33.62	268	26.72	135.0	5.15	6.08	1469.
280	3.91	33.63	278	26.73	134.4	5.29	6.46	1469.
290	3.88	33.64	288	26.74	133.9	5.42	6.85	1469.
300	3.86	33.65	298	26.75	132.9	5.55	7.25	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 44

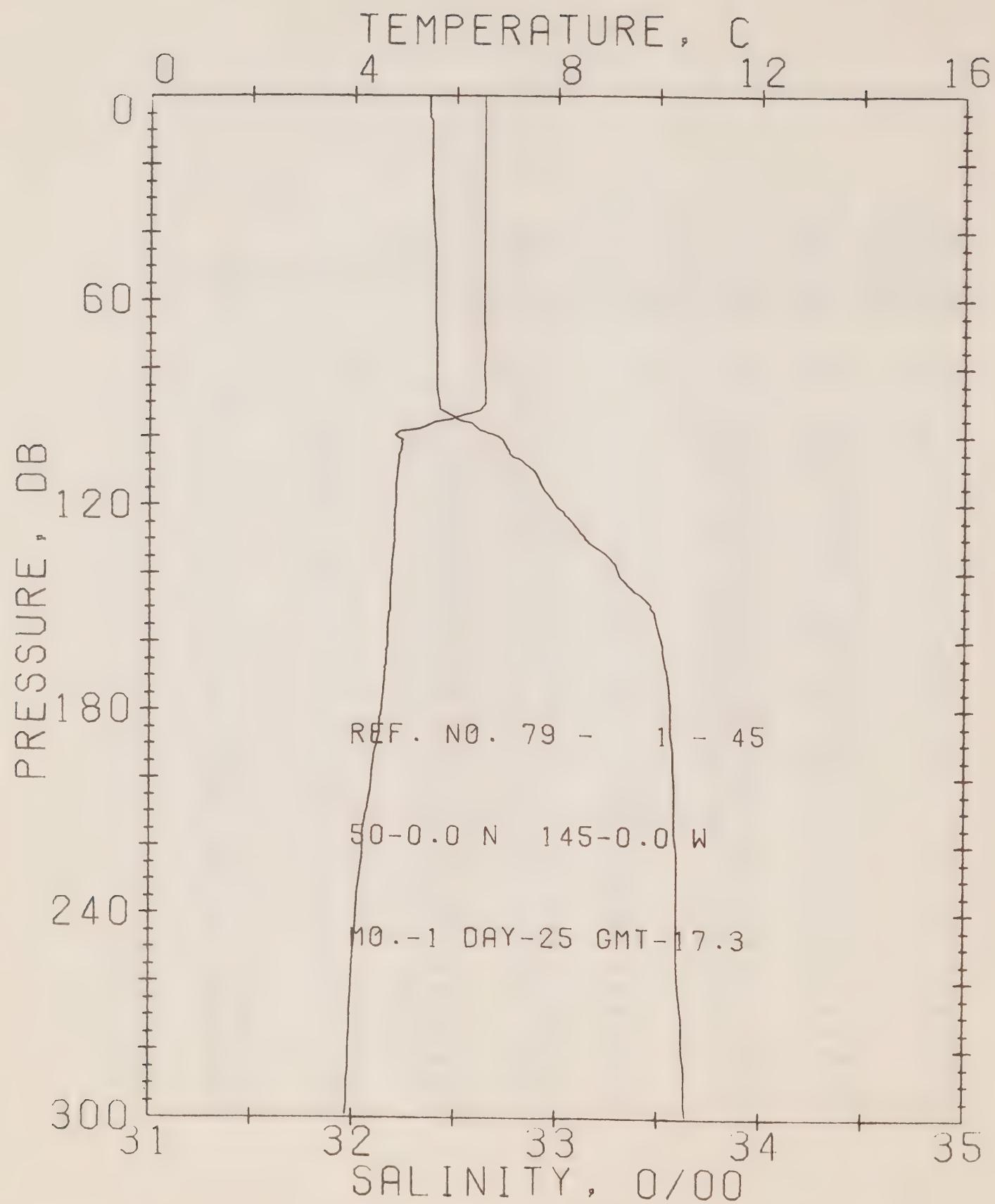
DATE 25/ 1/79

POSITION 49-52.0N, 145- 7.0W GMT 4.6 STATION W3

RESULTS OF STP CAST 131 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.53	32.39	0	25.45	253.8	.00	.00	1474.
10	6.54	32.39	10	25.45	254.0	.25	.01	1474.
20	6.54	32.40	20	25.45	253.6	.51	.05	1474.
30	6.54	32.40	30	25.46	253.5	.76	.12	1474.
40	6.54	32.40	40	25.46	253.6	1.01	.21	1474.
50	6.53	32.41	50	25.46	253.0	1.27	.32	1475.
60	6.53	32.41	60	25.47	252.7	1.52	.46	1475.
70	6.52	32.42	70	25.48	252.2	1.77	.63	1475.
80	6.52	32.42	80	25.48	252.3	2.03	.82	1475.
90	6.38	32.50	89	25.56	244.8	2.28	1.04	1475.
100	5.47	32.58	99	25.73	228.2	2.51	1.27	1471.
110	4.66	32.73	109	25.94	208.3	2.73	1.50	1468.
120	4.48	32.88	119	26.08	195.3	2.93	1.74	1468.
130	4.47	33.09	129	26.24	179.5	3.12	1.97	1468.
140	4.48	33.32	139	26.43	162.4	3.29	2.21	1469.
150	4.75	33.39	149	26.45	160.1	3.45	2.45	1470.
160	4.73	33.44	159	26.49	156.3	3.61	2.70	1470.
170	4.70	33.50	169	26.54	151.6	3.76	2.96	1471.
180	4.63	33.56	179	26.60	146.4	3.91	3.22	1470.
190	4.58	33.57	189	26.61	145.2	4.06	3.50	1470.
200	4.47	33.58	199	26.63	143.4	4.20	3.79	1470.
210	4.42	33.59	209	26.65	142.2	4.34	4.08	1470.
220	4.28	33.58	218	26.65	141.6	4.48	4.39	1470.
230	4.21	33.59	228	26.67	140.2	4.63	4.72	1470.
240	4.13	33.59	238	26.68	139.4	4.77	5.05	1469.
250	4.08	33.61	248	26.69	137.8	4.90	5.40	1469.
260	4.00	33.61	258	26.70	136.7	5.04	5.75	1469.
270	3.96	33.62	268	26.72	135.7	5.18	6.12	1469.
280	3.94	33.63	278	26.73	134.7	5.31	6.50	1469.
290	3.90	33.64	288	26.74	133.7	5.45	6.89	1469.
300	3.86	33.65	298	26.75	132.9	5.58	7.29	1469.



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REFERENCE NO. 79- 1- 45

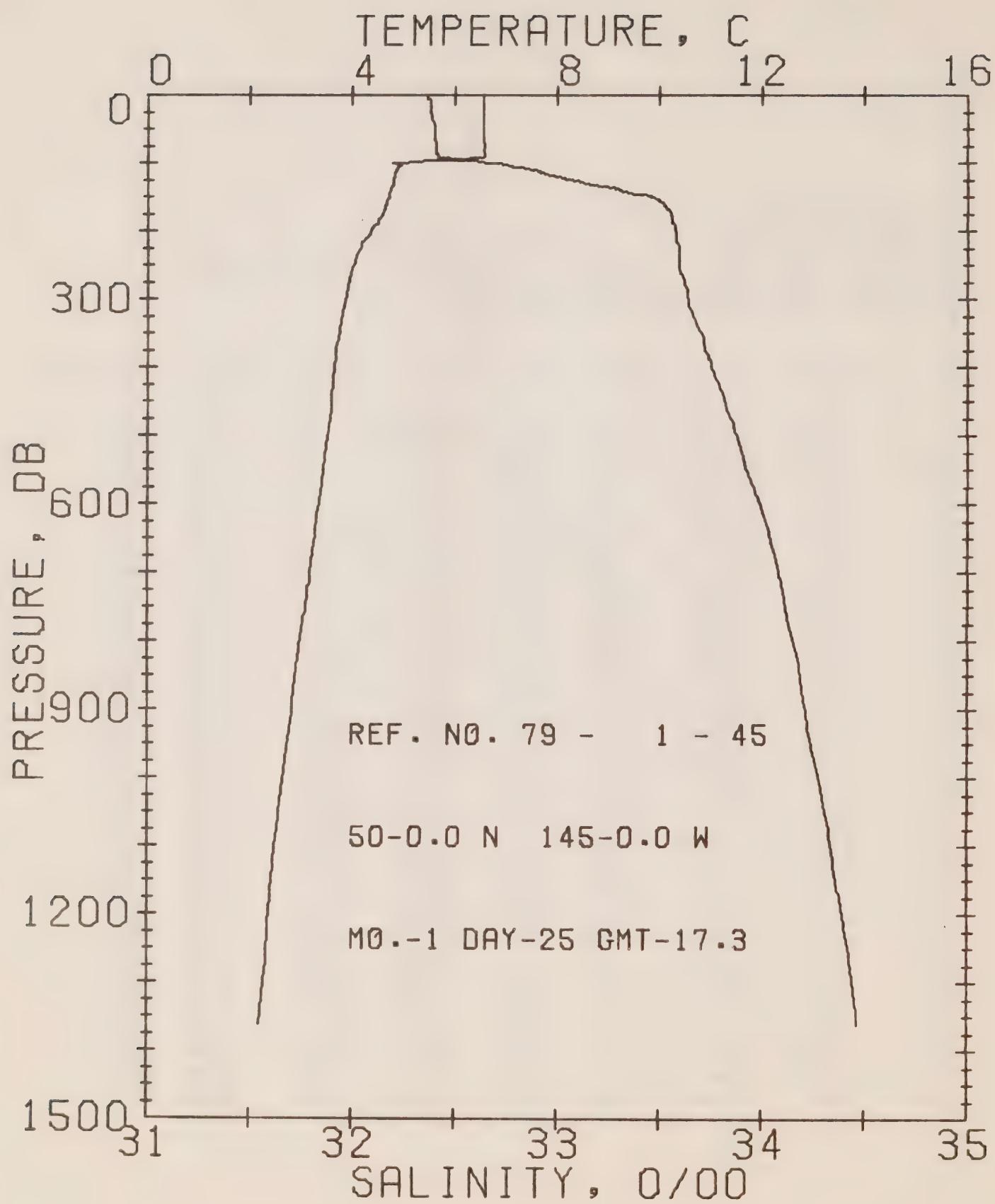
DATE 25/ 1/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 95 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.57	32.37	0	25.43	255.7	.00	.00	1474.
10	6.57	32.38	10	25.44	255.1	.26	.01	1474.
20	6.57	32.38	20	25.44	255.2	.51	.05	1474.
30	6.57	32.39	30	25.44	254.9	.77	.12	1474.
40	6.57	32.39	40	25.45	254.4	1.02	.21	1475.
50	6.57	32.40	50	25.45	254.1	1.27	.32	1475.
60	6.57	32.40	60	25.45	254.2	1.53	.47	1475.
70	6.58	32.41	70	25.46	254.0	1.78	.64	1475.
80	6.57	32.41	80	25.46	253.7	2.04	.83	1475.
90	6.58	32.42	89	25.47	253.4	2.29	1.05	1475.
100	4.81	32.71	99	25.91	211.3	2.53	1.28	1469.
110	4.80	32.89	109	26.04	198.4	2.73	1.50	1469.
120	4.82	32.99	119	26.13	190.6	2.93	1.73	1470.
130	4.79	33.14	129	26.29	179.1	3.11	1.96	1470.
140	4.74	33.30	139	26.38	166.3	3.28	2.20	1470.
150	4.71	33.46	149	26.51	154.5	3.44	2.43	1470.
160	4.67	33.51	159	26.56	150.0	3.60	2.67	1470.
170	4.60	33.54	169	26.59	147.3	3.75	2.92	1470.
180	4.55	33.56	179	26.61	145.5	3.89	3.19	1470.
190	4.45	33.57	189	26.62	144.1	4.04	3.46	1470.
200	4.36	33.57	199	26.64	142.6	4.18	3.74	1470.
210	4.26	33.58	209	26.65	141.3	4.32	4.04	1469.
220	4.19	33.59	218	26.67	140.2	4.46	4.35	1469.
230	4.13	33.59	228	26.68	139.4	4.60	4.67	1469.
240	4.07	33.59	238	26.68	138.8	4.74	5.00	1469.
250	4.02	33.59	248	26.69	138.4	4.88	5.35	1469.
260	3.98	33.60	258	26.70	137.4	5.02	5.71	1469.
270	3.96	33.61	268	26.71	136.0	5.15	6.08	1469.
280	3.93	33.62	278	26.72	135.3	5.29	6.46	1469.
290	3.90	33.63	288	26.73	134.4	5.42	6.85	1469.
300	3.86	33.64	298	26.74	133.4	5.56	7.25	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 45 DATE 25/ 1/79

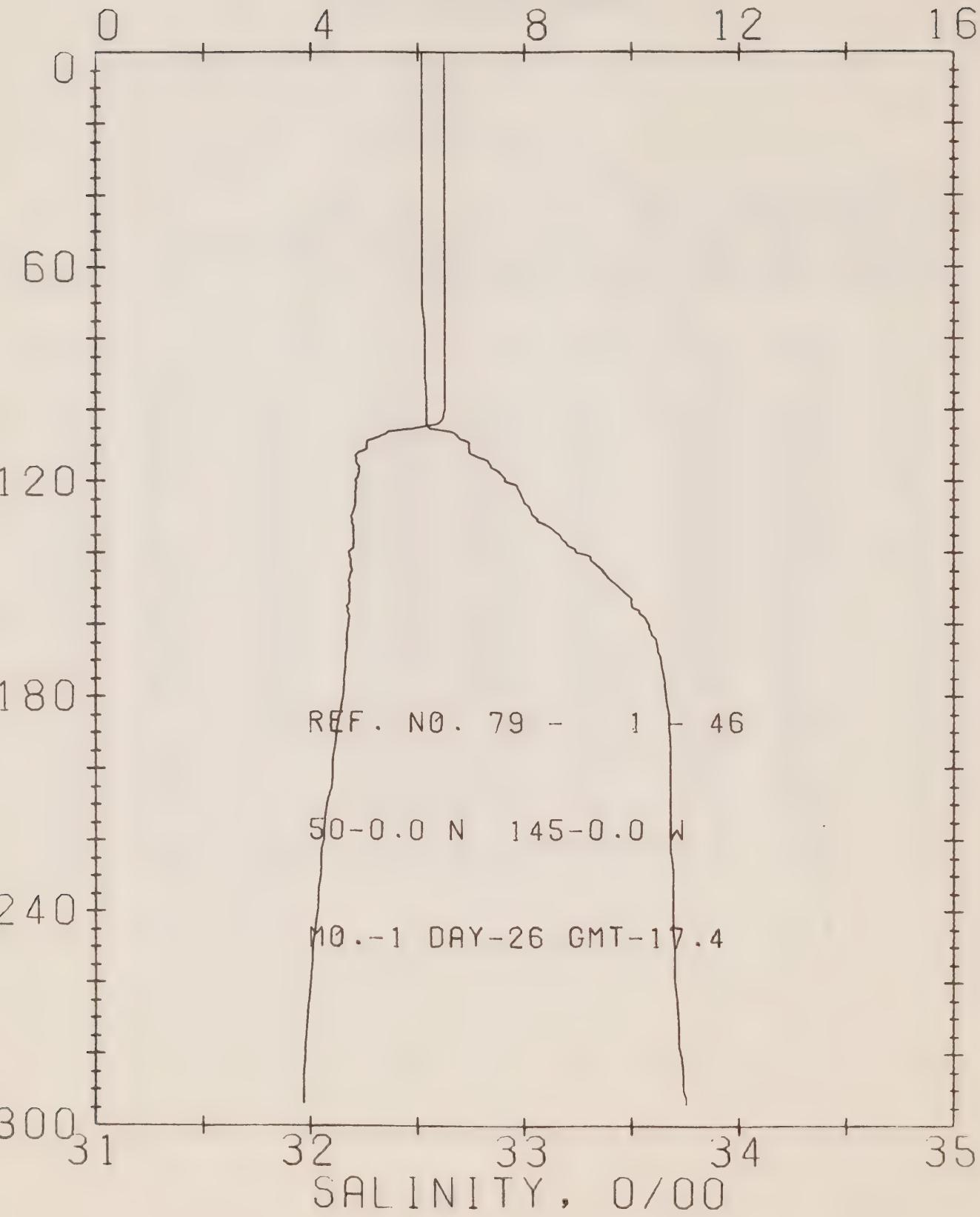
POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 169 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.57	32.37	0	25.43	255.7	.00	.00	1474.
10	6.57	32.36	10	25.44	255.1	.26	.01	1474.
20	6.57	32.38	20	25.44	255.2	.51	.05	1474.
30	6.57	32.39	30	25.44	254.9	.77	.12	1474.
50	6.57	32.40	50	25.45	254.1	1.27	.32	1475.
75	6.58	32.41	75	25.46	253.8	1.91	.73	1475.
100	4.81	32.71	99	25.91	211.3	2.53	1.28	1469.
125	4.81	33.07	124	26.19	184.3	3.02	1.84	1470.
150	4.71	33.46	149	26.51	154.5	3.44	2.43	1470.
175	4.58	33.55	174	26.60	146.6	3.82	3.05	1470.
200	4.36	33.57	199	26.64	142.6	4.18	3.74	1470.
225	4.17	33.59	223	26.67	139.7	4.53	4.51	1469.
250	4.02	33.59	248	26.69	138.4	4.88	5.35	1469.
300	3.86	33.64	298	26.74	133.4	5.56	7.25	1469.
400	3.65	33.75	397	26.85	123.8	6.85	11.83	1470.
500	3.53	33.87	496	26.96	113.9	8.03	17.26	1471.
600	3.34	33.99	595	27.07	104.0	9.12	23.37	1473.
800	2.97	34.15	793	27.23	89.9	11.06	37.13	1474.
1000	2.64	34.28	990	27.36	77.7	12.74	52.50	1476.
1200	2.36	34.39	1138	27.48	67.3	14.18	68.68	1479.

TEMPERATURE, C

PRESSURE, DB



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 46

DATE 26/ 1/79

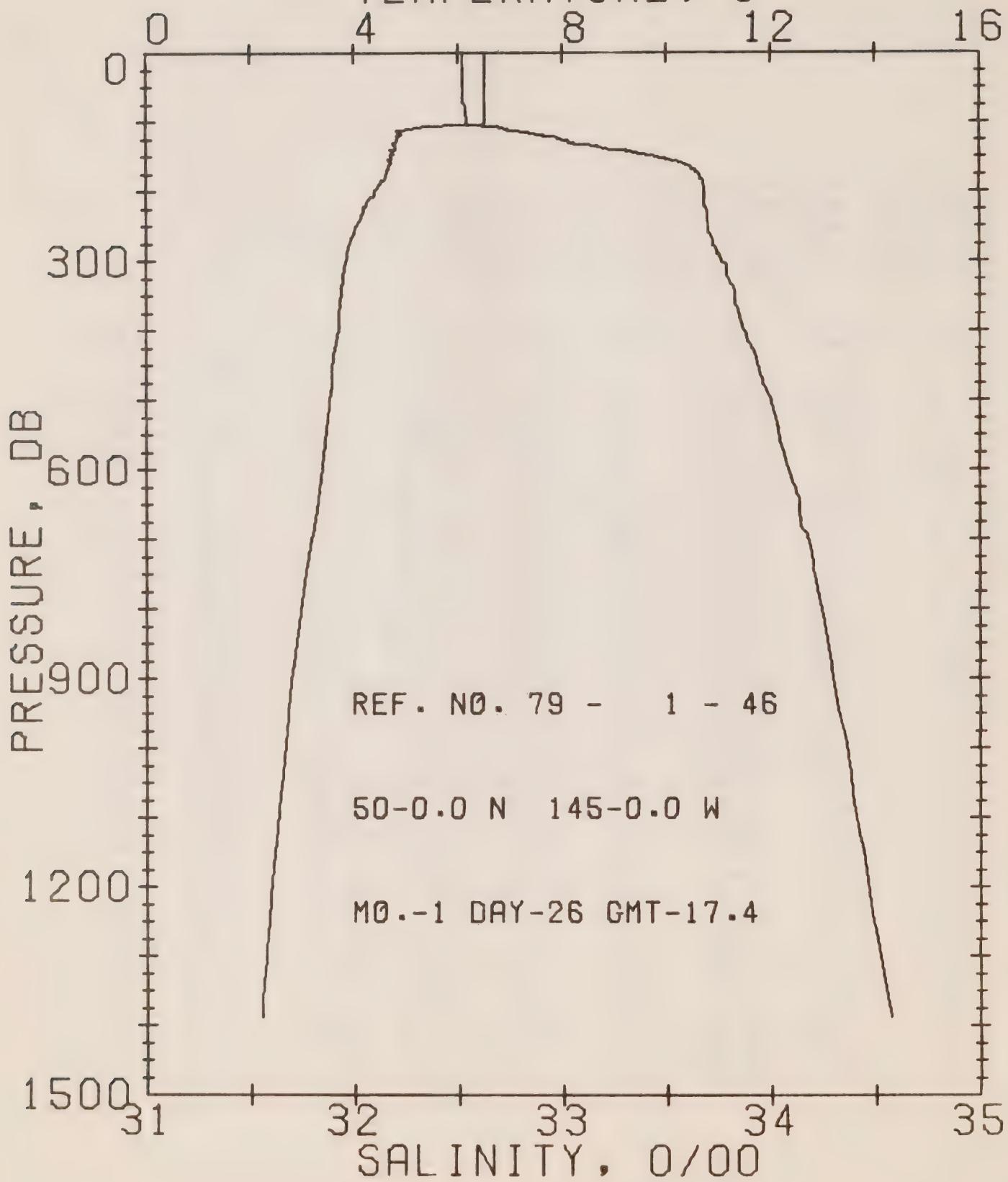
POSITION 50- .0N, 145- .0W GMT 17.4 STATION P

RESULTS OF STP CAST 114 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.50	32.52	0	25.56	243.7	.00	.00	1474.
10	6.50	32.52	10	25.56	243.8	.24	.01	1474.
20	6.50	32.52	20	25.56	243.9	.49	.05	1474.
30	6.50	32.52	30	25.56	244.1	.73	.11	1474.
40	6.51	32.52	40	25.56	244.2	.98	.20	1474.
50	6.50	32.52	50	25.56	244.3	1.22	.31	1475.
60	6.51	32.52	60	25.56	244.5	1.46	.45	1475.
70	6.52	32.52	70	25.55	244.8	1.71	.61	1475.
80	6.51	32.53	79	25.56	244.0	1.95	.80	1475.
90	6.52	32.53	89	25.56	244.3	2.20	1.01	1475.
100	6.50	32.54	99	25.57	243.4	2.44	1.24	1475.
110	5.05	32.74	109	25.90	211.7	2.67	1.49	1470.
120	4.83	32.91	119	26.06	196.7	2.88	1.73	1469.
130	4.76	33.05	129	26.18	185.5	3.07	1.97	1470.
140	4.70	33.24	139	26.34	170.7	3.24	2.22	1470.
150	4.73	33.45	149	26.50	155.4	3.41	2.46	1470.
160	4.70	33.58	159	26.61	145.5	3.56	2.69	1470.
170	4.65	33.63	169	26.66	141.0	3.70	2.93	1470.
180	4.60	33.66	179	26.68	138.7	3.84	3.18	1470.
190	4.48	33.67	189	26.70	136.4	3.98	3.44	1470.
200	4.41	33.68	199	26.72	135.3	4.11	3.71	1470.
210	4.30	33.62	209	26.73	134.2	4.25	3.99	1470.
220	4.25	33.68	218	26.73	133.8	4.38	4.29	1470.
230	4.17	33.69	228	26.75	132.2	4.51	4.59	1470.
240	4.11	33.69	238	26.76	131.7	4.65	4.91	1469.
250	4.03	33.70	248	26.77	130.2	4.78	5.24	1469.
260	3.99	33.70	258	26.78	129.8	4.91	5.57	1469.
270	3.94	33.71	268	26.79	128.3	5.04	5.92	1469.
280	3.89	33.73	278	26.81	127.1	5.16	6.28	1469.
290	3.87	33.74	288	26.82	125.9	5.29	6.65	1469.
300	3.85	33.76	298	26.84	123.9	5.42	7.02	1469.

TEMPERATURE, C



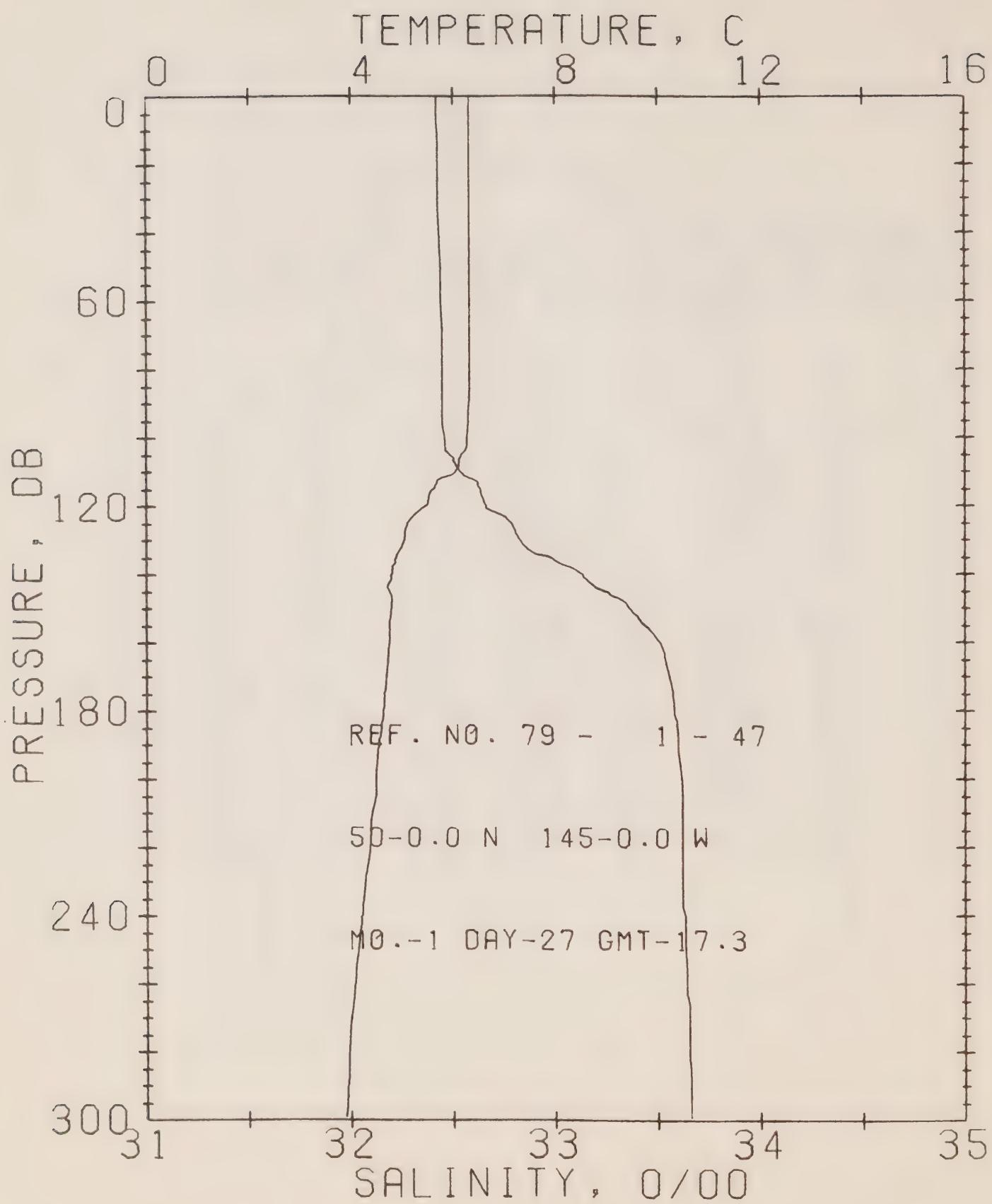
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 46 DATE 26/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.4 STATION P

RESULTS OF STP CAST 182 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.50	32.52	0	25.56	243.7	.00	.00	1474.
10	6.50	32.52	10	25.56	243.8	.24	.01	1474.
20	6.50	32.52	20	25.56	243.9	.49	.05	1474.
30	6.50	32.52	30	25.56	244.1	.73	.11	1474.
50	6.50	32.52	50	25.56	244.3	1.22	.31	1475.
75	6.51	32.53	75	25.56	244.2	1.83	.70	1475.
100	6.50	32.54	99	25.57	243.4	2.44	1.24	1475.
125	4.83	32.99	124	26.13	190.5	2.97	1.85	1470.
150	4.73	33.45	149	26.50	155.4	3.41	2.46	1470.
175	4.62	33.65	174	26.67	139.5	3.77	3.06	1470.
200	4.41	33.68	199	26.72	135.3	4.11	3.71	1470.
225	4.19	33.68	223	26.74	132.9	4.45	4.44	1470.
250	4.03	33.70	248	26.77	130.2	4.78	5.24	1469.
300	3.85	33.76	298	26.84	123.9	5.42	7.02	1469.
400	3.69	33.87	397	26.94	115.3	6.61	11.26	1471.
500	3.53	34.00	496	27.06	104.7	7.70	16.30	1472.
600	3.37	34.08	595	27.14	98.0	8.72	21.98	1473.
800	2.96	34.24	793	27.30	82.9	10.52	34.76	1474.
1000	2.65	34.36	990	27.43	71.6	12.06	48.89	1477.
1200	2.39	34.46	1188	27.53	62.4	13.41	63.92	1479.



OFFSHORE OCEANOGRAPHY GROUP

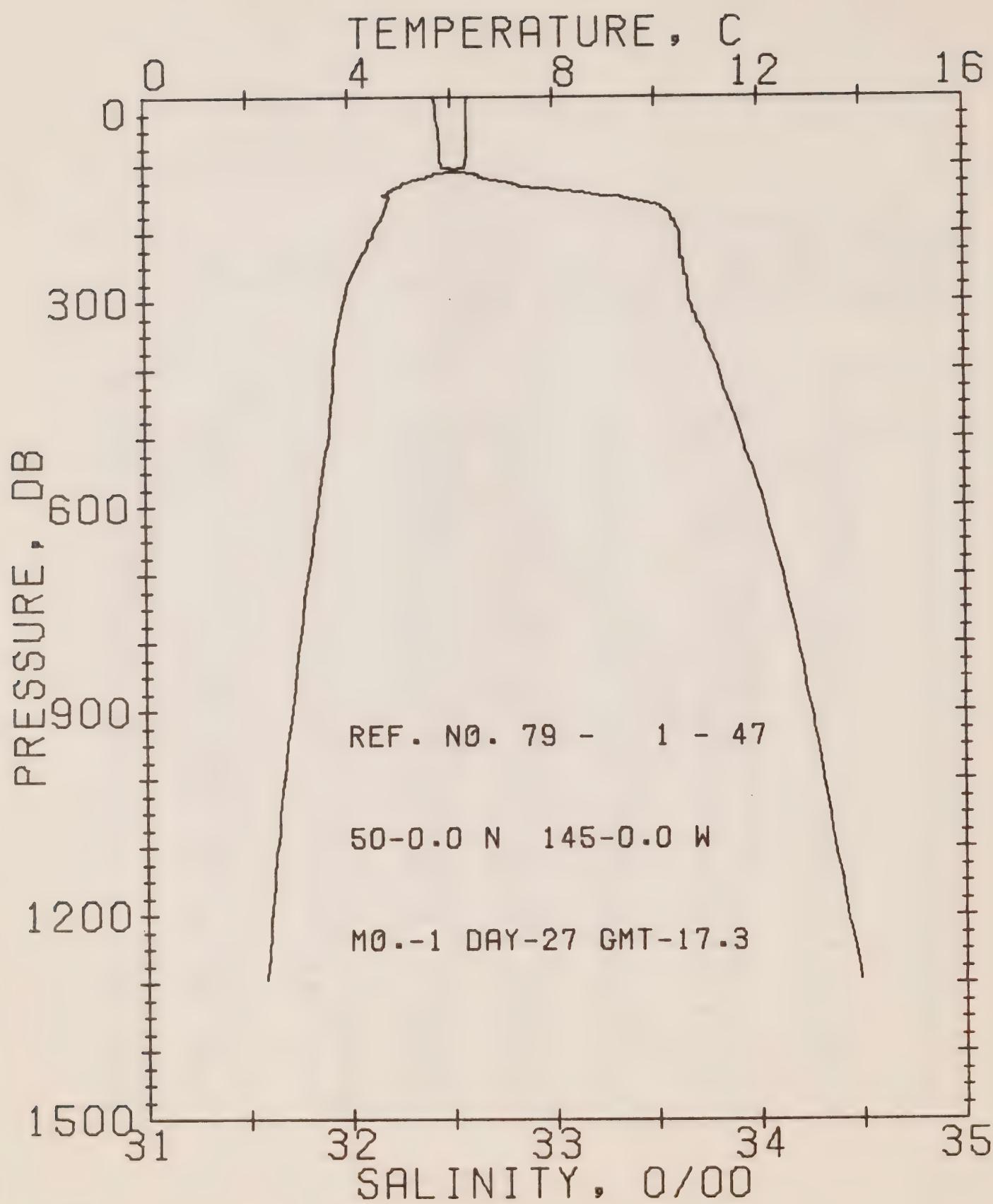
REFERENCE NO. 79- 1- 47 DATE 27/ 1/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 163 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED. PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.34	32.42	0	25.50	249.2	.00	.00	1473.
10	6.32	32.43	10	25.51	248.7	.25	.01	1473.
20	6.32	32.43	20	25.51	248.5	.50	.05	1473.
30	6.32	32.43	30	25.51	248.6	.75	.11	1473.
40	6.32	32.43	40	25.51	248.4	.99	.20	1474.
50	6.33	32.44	50	25.52	248.2	1.24	.32	1474.
60	6.31	32.44	60	25.52	248.0	1.49	.46	1474.
70	6.31	32.45	70	25.53	247.4	1.74	.62	1474.
80	6.31	32.45	80	25.53	247.5	1.99	.81	1474.
90	6.30	32.45	89	25.53	247.6	2.23	1.02	1474.
100	6.28	32.46	99	25.54	246.8	2.48	1.26	1474.
110	6.05	32.53	109	25.62	238.8	2.72	1.52	1474.
120	5.49	32.66	119	25.79	222.7	2.95	1.79	1472.
130	5.03	32.83	129	25.98	204.9	3.16	2.06	1470.
140	4.80	33.13	139	26.24	180.0	3.36	2.33	1470.
150	4.78	33.37	149	26.43	162.2	3.53	2.58	1470.
160	4.74	33.51	159	26.55	151.1	3.69	2.83	1471.
170	4.68	33.55	169	26.59	147.3	3.83	3.08	1471.
180	4.62	33.58	179	26.62	144.9	3.98	3.34	1470.
190	4.54	33.60	189	26.64	142.5	4.12	3.61	1470.
200	4.49	33.61	199	26.66	141.1	4.27	3.89	1470.
210	4.41	33.62	209	26.67	139.8	4.41	4.18	1470.
220	4.35	33.62	218	26.68	139.3	4.55	4.49	1470.
230	4.26	33.62	228	26.69	138.4	4.68	4.81	1470.
240	4.21	33.63	238	26.70	137.3	4.82	5.14	1470.
250	4.13	33.63	248	26.71	136.4	4.96	5.48	1470.
260	4.07	33.64	258	26.72	135.2	5.09	5.83	1470.
270	4.00	33.65	268	26.74	133.8	5.23	6.20	1469.
280	3.96	33.65	278	26.74	133.5	5.36	6.57	1469.
290	3.93	33.66	288	26.75	132.5	5.50	6.96	1469.
300	3.89	33.66	298	26.76	132.1	5.63	7.35	1469.



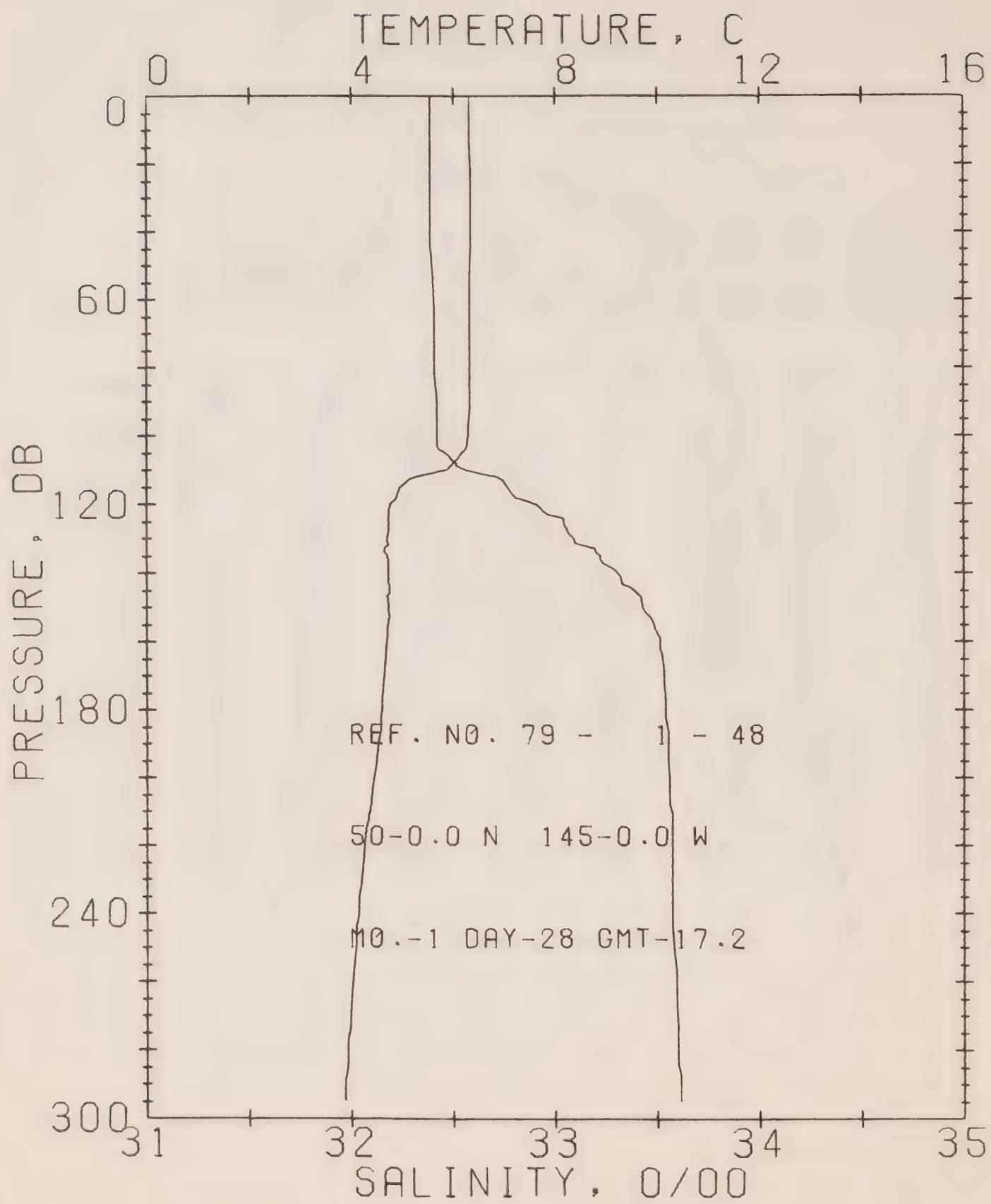
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 47 DATE 27/ 1/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 153 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.34	32.42	0	25.50	249.2	.00	.00	1473.
10	6.32	32.43	10	25.51	248.7	.25	.01	1473.
20	6.32	32.43	20	25.51	248.5	.50	.05	1473.
30	6.32	32.43	30	25.51	248.6	.75	.11	1473.
50	6.33	32.44	50	25.52	248.2	1.24	.32	1474.
75	6.31	32.45	75	25.53	247.5	1.86	.71	1474.
100	6.28	32.46	99	25.54	246.8	2.48	1.26	1474.
125	6.10	32.79	124	26.94	208.6	3.06	1.93	1471.
150	4.78	33.37	149	26.43	162.2	3.53	2.58	1470.
175	4.65	33.57	174	26.60	145.8	3.91	3.20	1471.
200	4.49	33.61	199	26.66	141.1	4.27	3.89	1470.
225	4.32	33.62	223	26.68	139.0	4.61	4.65	1470.
250	4.13	33.63	248	26.71	136.4	4.96	5.48	1470.
300	3.89	33.66	298	26.76	132.1	5.63	7.35	1469.
400	3.69	33.80	397	26.89	120.3	6.89	11.84	1470.
500	3.58	33.92	496	26.99	111.3	8.05	17.15	1472.
600	3.37	34.02	595	27.09	102.2	9.12	23.12	1473.
800	2.99	34.18	793	27.26	87.5	11.00	36.54	1475.
1000	2.68	34.31	990	27.39	75.8	12.63	51.45	1477.
1200	2.42	34.43	1188	27.50	65.5	14.05	67.25	1479.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 48

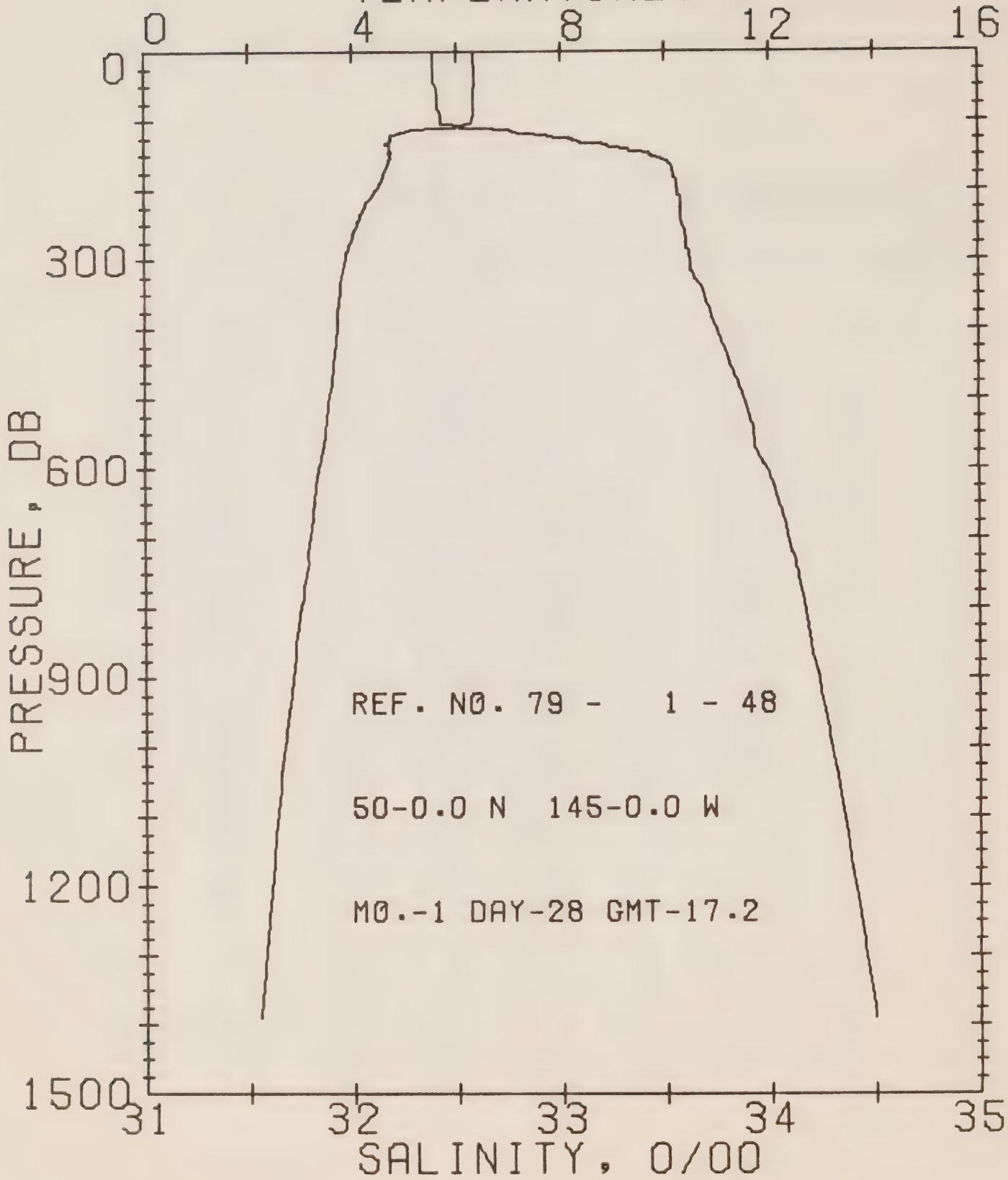
DATE 28/ 1/79

POSITION 50° .0N, 145° .0W GMT 17.2 STATION P

RESULTS OF STP CAST 106 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.33	32.39	0	25.48	251.3	.00	.00	1473.
10	6.33	32.39	10	25.48	251.5	.25	.01	1473.
20	6.34	32.39	20	25.48	251.7	.50	.05	1473.
30	6.34	32.39	30	25.48	251.8	.75	.12	1473.
40	6.35	32.39	40	25.47	252.0	1.01	.21	1474.
50	6.34	32.40	50	25.48	251.5	1.26	.32	1474.
60	6.33	32.40	60	25.49	250.9	1.51	.46	1474.
70	6.32	32.41	70	25.49	250.5	1.76	.63	1474.
80	6.31	32.41	80	25.49	250.5	2.01	.82	1474.
90	6.31	32.42	89	25.50	249.9	2.26	1.04	1474.
100	6.29	32.42	99	25.51	249.8	2.51	1.28	1474.
110	5.88	32.56	109	25.67	234.5	2.76	1.54	1473.
120	4.76	32.91	119	26.07	195.9	2.97	1.79	1469.
130	4.70	33.09	129	26.22	181.9	3.15	2.03	1469.
140	4.72	33.31	139	26.39	165.7	3.33	2.26	1470.
150	4.72	33.43	149	26.49	156.8	3.49	2.50	1470.
160	4.69	33.51	159	26.55	150.6	3.64	2.74	1470.
170	4.62	33.53	169	26.58	148.5	3.79	2.99	1470.
180	4.58	33.54	179	26.59	147.4	3.94	3.26	1470.
190	4.51	33.55	189	26.60	146.0	4.09	3.53	1470.
200	4.43	33.56	199	26.62	144.5	4.23	3.82	1470.
210	4.35	33.57	209	26.64	142.9	4.37	4.12	1470.
220	4.25	33.57	218	26.65	142.0	4.52	4.44	1470.
230	4.18	33.57	228	26.65	141.3	4.66	4.76	1469.
240	4.12	33.57	238	26.66	140.8	4.80	5.10	1469.
250	4.07	33.58	248	26.68	139.5	4.94	5.45	1469.
260	4.02	33.59	258	26.69	138.4	5.08	5.81	1469.
270	3.98	33.60	268	26.70	137.6	5.22	6.18	1469.
280	3.92	33.60	278	26.70	136.8	5.35	6.57	1469.
290	3.88	33.61	288	26.72	135.7	5.49	6.96	1469.
300	3.84	33.62	298	26.72	135.0	5.63	7.37	1469.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 48 DATE 28/ 1/79

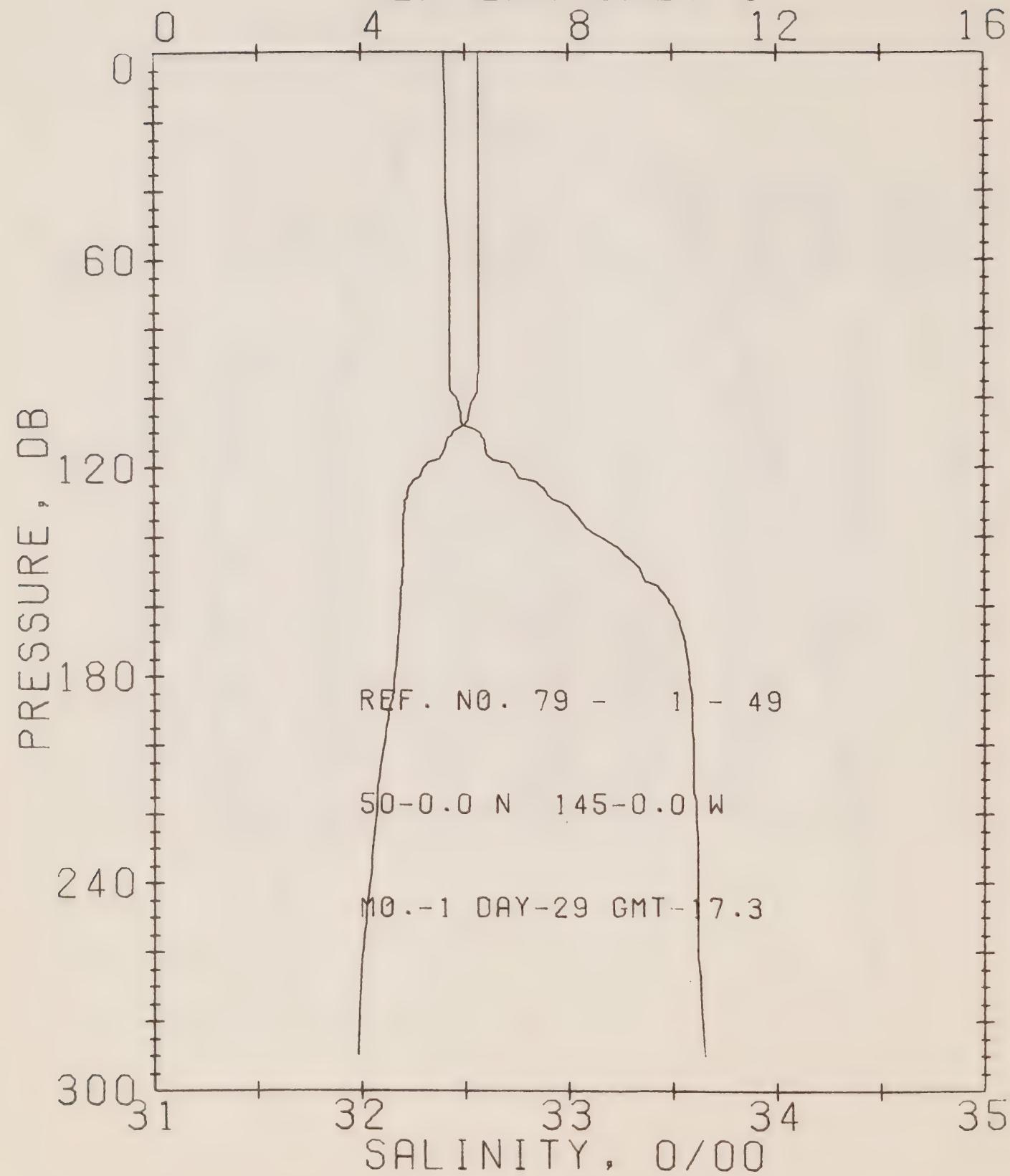
POSITION 50- .0N, 145- .0W GMT 17.2 STATION P

RESULTS OF STP CAST 173 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED,PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.33	32.39	0	25.48	251.3	.00	.00	1473.
10	6.33	32.39	10	25.48	251.5	.25	.01	1473.
20	6.34	32.39	20	25.48	251.7	.50	.05	1473.
30	6.34	32.39	30	25.48	251.8	.75	.12	1473.
50	6.34	32.40	50	25.48	251.5	1.26	.32	1474.
75	6.31	32.41	75	25.49	250.5	1.89	.72	1474.
100	6.29	32.42	99	25.51	249.8	2.51	1.28	1474.
125	4.71	33.04	124	26.18	185.7	3.06	1.91	1469.
150	4.72	33.43	149	26.49	156.8	3.49	2.50	1470.
175	4.60	33.54	174	26.58	147.8	3.86	3.12	1470.
200	4.43	33.56	199	26.62	144.5	4.23	3.82	1470.
225	4.22	33.57	223	26.65	141.7	4.59	4.60	1470.
250	4.07	33.58	248	26.68	139.5	4.94	5.45	1469.
300	3.84	33.62	298	26.72	135.0	5.63	7.37	1469.
400	3.69	33.74	397	26.84	124.7	6.92	12.00	1470.
500	3.54	33.88	496	26.96	114.0	8.12	17.46	1472.
600	3.33	33.98	595	27.07	104.5	9.22	23.61	1472.
800	2.98	34.16	793	27.24	88.6	11.14	37.27	1474.
1000	2.66	34.29	990	27.37	76.9	12.80	52.44	1477.
1200	2.40	34.41	1188	27.49	66.8	14.23	68.47	1479.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

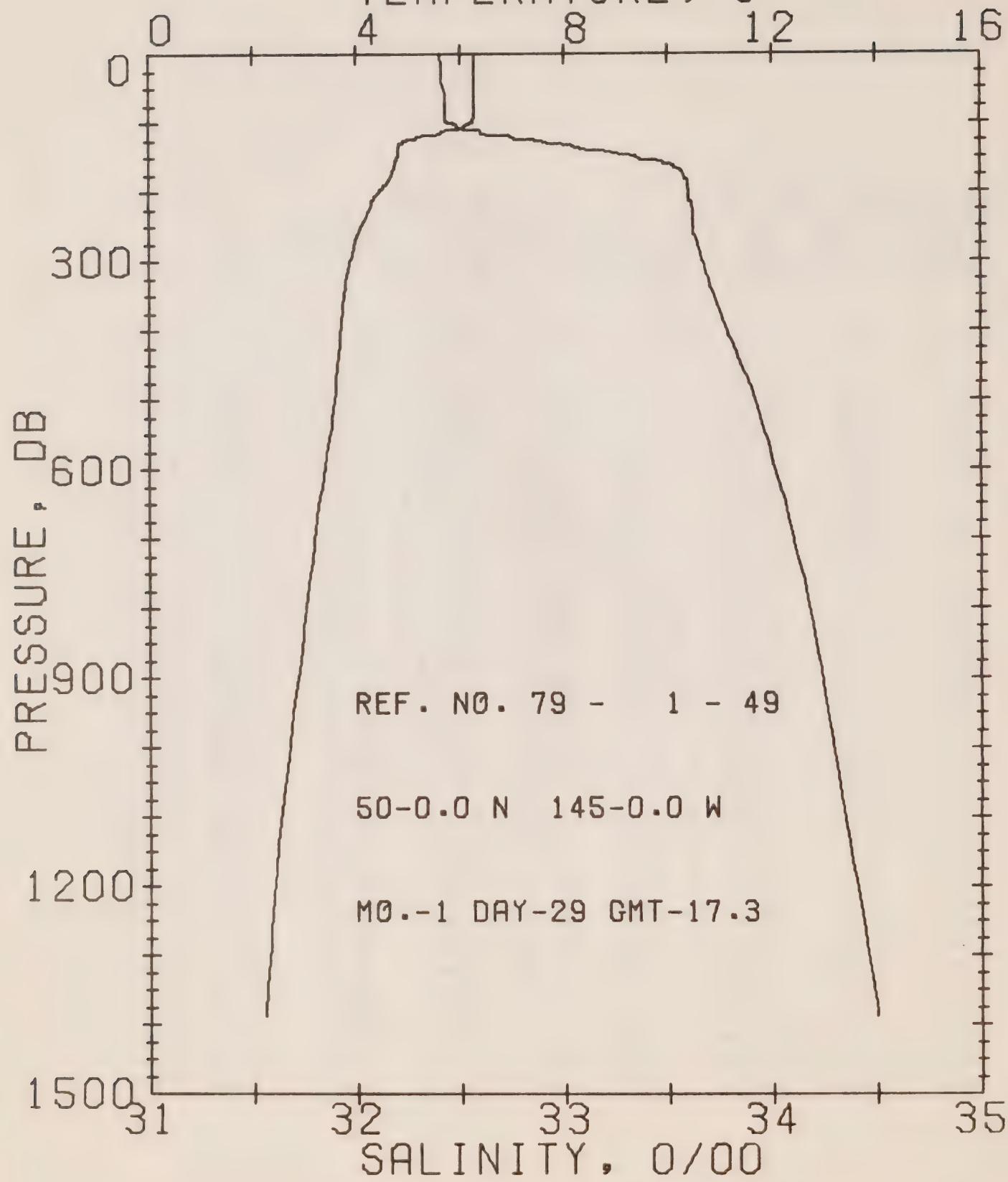
REFERENCE NO. 79- 1- 49 DATE 20/ 1/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 96 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.28	32.40	0	25.49	250.0	.00	.00	1473.
10	6.28	32.40	10	25.49	249.8	.25	.01	1473.
20	6.28	32.41	20	25.50	249.5	.50	.05	1473.
30	6.28	32.41	30	25.50	249.6	.75	.11	1473.
40	6.28	32.41	40	25.50	249.7	1.00	.20	1473.
50	6.28	32.42	50	25.51	249.1	1.25	.32	1474.
60	6.28	32.43	60	25.51	248.4	1.50	.46	1474.
70	6.28	32.43	70	25.51	248.6	1.75	.62	1474.
80	6.28	32.43	80	25.51	248.7	1.99	.81	1474.
90	6.28	32.43	89	25.51	248.8	2.24	1.03	1474.
100	6.18	32.46	99	25.55	245.5	2.49	1.27	1474.
110	5.75	32.57	109	25.69	232.3	2.73	1.53	1473.
120	5.22	32.72	119	25.87	214.8	2.96	1.79	1471.
130	4.83	32.96	129	26.10	193.0	3.16	2.05	1470.
140	4.80	33.15	139	26.26	178.6	3.35	2.31	1470.
150	4.78	33.35	149	26.42	163.5	3.52	2.56	1470.
160	4.74	33.50	159	26.54	151.9	3.68	2.81	1471.
170	4.69	33.56	169	26.59	147.0	3.83	3.06	1471.
180	4.63	33.58	179	26.62	144.9	3.97	3.32	1471.
190	4.54	33.59	189	26.63	143.3	4.12	3.59	1470.
200	4.42	33.60	199	26.65	141.4	4.26	3.87	1470.
210	4.32	33.60	209	26.66	140.4	4.40	4.17	1470.
220	4.28	33.61	218	26.68	139.3	4.54	4.47	1470.
230	4.22	33.62	228	26.69	138.0	4.68	4.79	1470.
240	4.15	33.62	238	26.70	137.3	4.82	5.12	1470.
250	4.09	33.62	248	26.70	136.8	4.95	5.46	1469.
260	4.01	33.62	258	26.71	136.2	5.09	5.82	1469.
270	3.97	33.63	268	26.72	134.9	5.22	6.19	1469.
280	3.94	33.64	278	26.74	133.9	5.36	6.56	1469.
290	3.91	33.65	288	26.75	133.1	5.49	6.95	1469.
300	3.86	33.66	298	26.76	132.0	5.63	7.35	1469.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 49 DATE 29/ 1/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

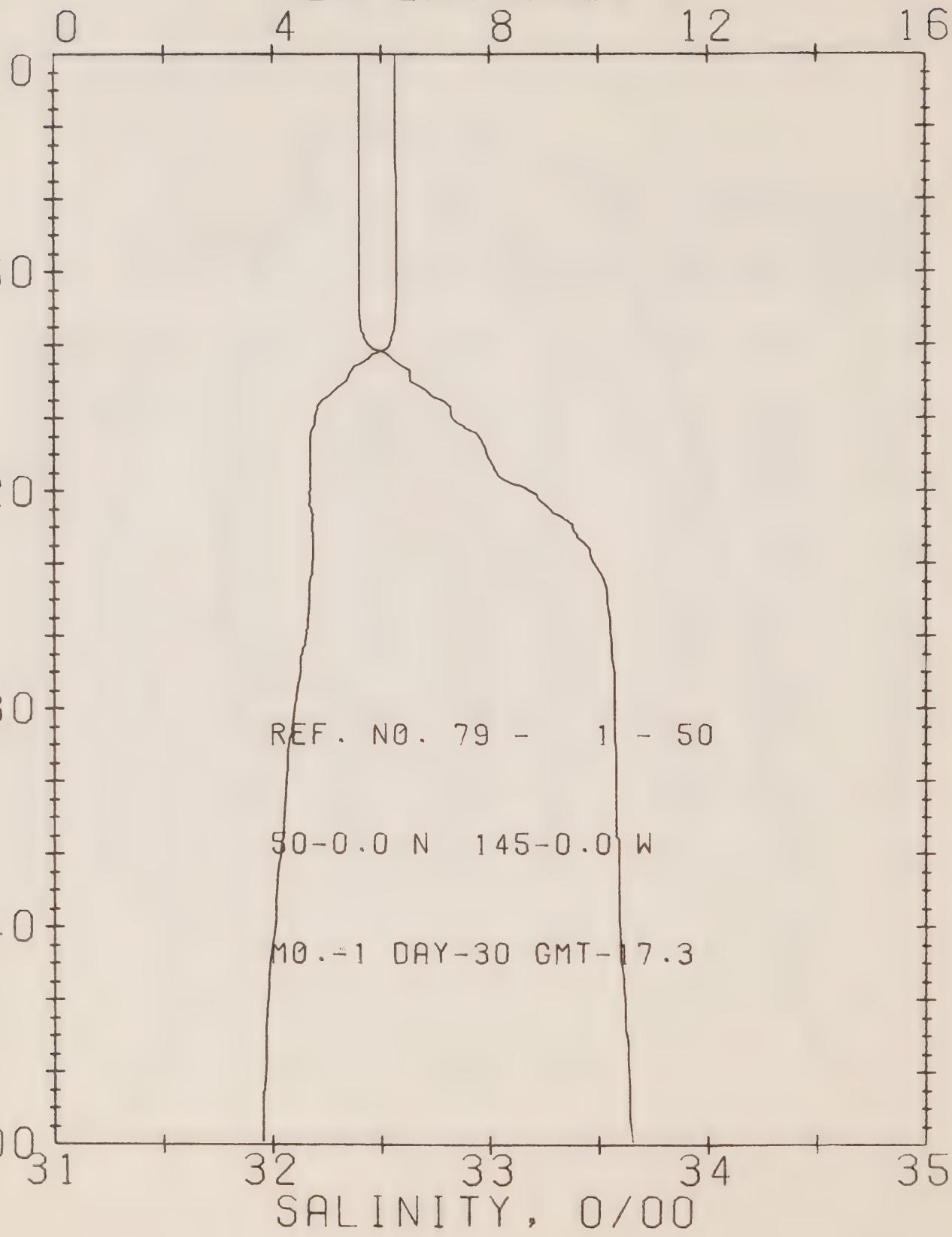
RESULTS OF STP CAST 147 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.28	32.40	0	25.49	250.0	.00	.00	1473.
10	6.28	32.40	10	25.49	249.8	.25	.01	1473.
20	6.28	32.41	20	25.50	249.5	.50	.05	1473.
30	6.28	32.41	30	25.50	249.6	.75	.11	1473.
50	6.28	32.42	50	25.51	249.1	1.25	.32	1474.
75	6.28	32.43	75	25.51	248.6	1.87	.71	1474.
100	6.18	32.46	99	25.55	245.5	2.49	1.27	1474.
125	4.95	32.86	124	26.01	201.7	3.06	1.92	1470.
150	4.78	33.35	149	26.42	163.5	3.52	2.56	1470.
175	4.67	33.57	174	26.60	146.1	3.90	3.19	1471.
200	4.42	33.60	199	26.65	141.4	4.26	3.87	1470.
225	4.25	33.61	223	26.68	138.7	4.61	4.63	1470.
250	4.09	33.62	248	26.70	136.8	4.95	5.46	1469.
300	3.86	33.66	298	26.76	132.0	5.63	7.35	1469.
400	3.70	33.78	397	26.87	122.0	6.90	11.87	1470.
500	3.57	33.91	496	26.99	111.4	8.06	17.21	1472.
600	3.38	34.01	595	27.08	103.2	9.13	23.21	1473.
800	3.01	34.17	793	27.25	88.3	11.04	36.75	1475.
1000	2.68	34.29	990	27.37	77.1	12.69	51.86	1477.
1200	2.40	34.40	1188	27.49	66.8	14.13	67.95	1479.

TEMPERATURE, C

PRESSURE, DB



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 50 DATE 30/ 1/79

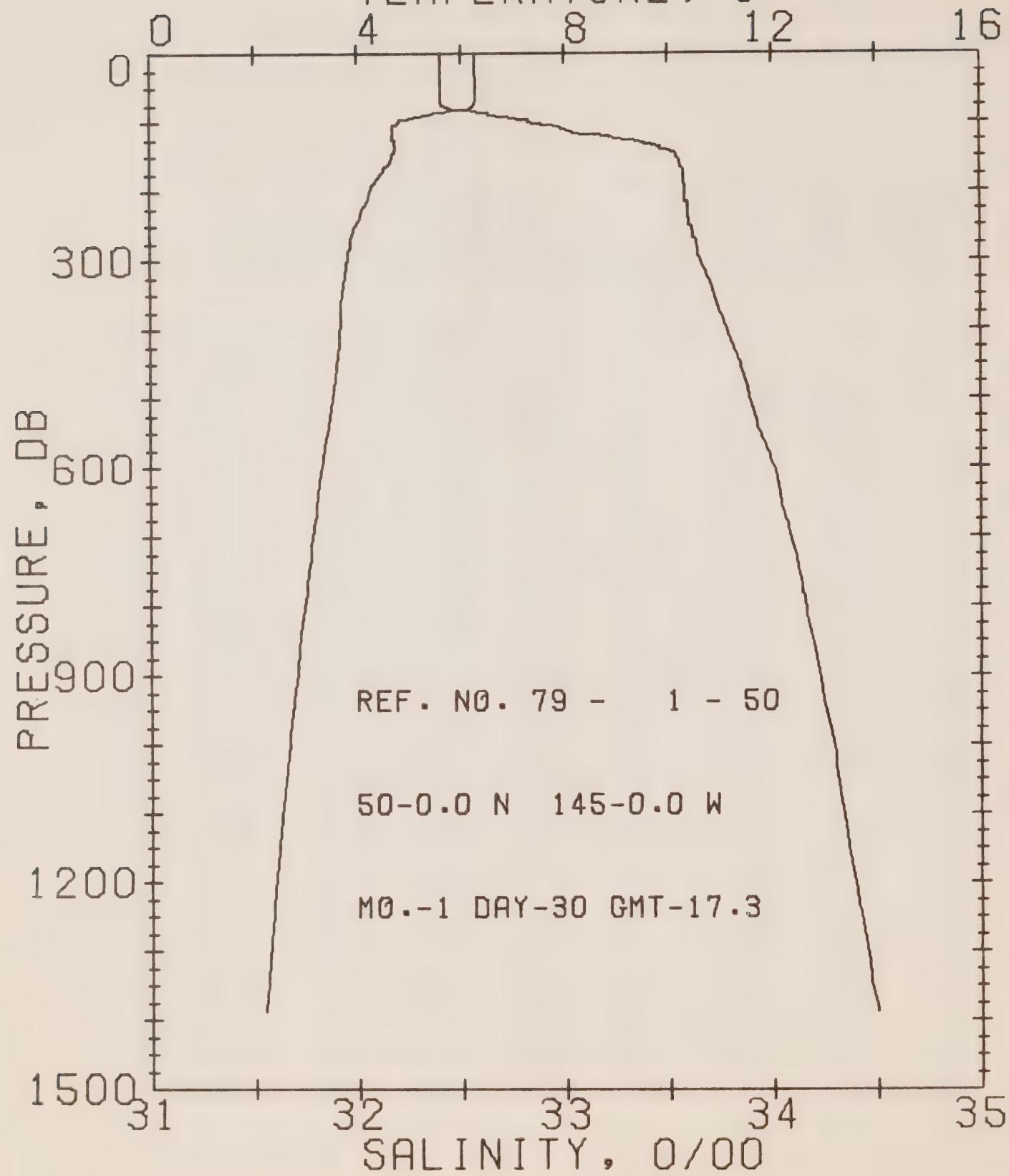
POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 122 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.28	32.40	0	25.49	250.0	.00	.00	1473.
10	6.28	32.40	10	25.49	250.1	.25	.01	1473.
20	6.28	32.40	20	25.49	250.2	.50	.05	1473.
30	6.28	32.40	30	25.49	250.4	.75	.11	1473.
40	6.29	32.40	40	25.49	250.6	1.00	.20	1473.
50	6.30	32.40	50	25.49	250.8	1.25	.32	1474.
60	6.30	32.40	60	25.49	250.9	1.50	.46	1474.
70	6.28	32.40	70	25.49	250.8	1.75	.63	1474.
80	6.15	32.44	80	25.54	246.4	2.00	.82	1474.
90	5.35	32.63	89	25.78	223.0	2.23	1.02	1471.
100	4.78	32.83	99	26.01	202.0	2.44	1.22	1469.
110	4.70	32.99	109	26.14	189.2	2.64	1.43	1469.
120	4.70	33.18	119	26.29	175.1	2.82	1.64	1469.
130	4.71	33.38	129	26.45	160.3	2.99	1.86	1470.
140	4.73	33.48	139	26.52	153.1	3.15	2.07	1470.
150	4.68	33.54	149	26.58	148.1	3.30	2.29	1470.
160	4.60	33.55	159	26.60	146.4	3.44	2.53	1470.
170	4.51	33.57	169	26.62	144.3	3.59	2.77	1470.
180	4.40	33.57	179	26.63	143.2	3.73	3.03	1470.
190	4.29	33.57	189	26.65	141.9	3.88	3.30	1469.
200	4.24	33.58	199	26.66	141.0	4.02	3.58	1469.
210	4.20	33.58	209	26.66	140.7	4.16	3.87	1469.
220	4.13	33.59	218	26.66	139.3	4.30	4.18	1469.
230	4.06	33.59	228	26.66	138.6	4.44	4.50	1469.
240	4.03	33.59	238	26.69	138.1	4.58	4.83	1469.
250	3.95	33.60	248	26.70	136.8	4.71	5.17	1469.
260	3.91	33.62	258	26.72	135.2	4.85	5.53	1469.
270	3.87	33.62	268	26.73	134.4	4.98	5.89	1469.
280	3.85	33.63	278	26.74	133.6	5.12	6.27	1469.
290	3.82	33.64	288	26.75	132.9	5.25	6.65	1469.
300	3.81	33.65	298	26.76	132.1	5.38	7.05	1469.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 50 DATE 30/ 1/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 186 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED,PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	0.28	32.40	0	25.49	250.0	.00	.00	1473.
10	0.28	32.40	10	25.49	250.1	.25	.01	1473.
20	0.28	32.40	20	25.49	250.2	.50	.05	1473.
30	0.28	32.40	30	25.49	250.4	.75	.11	1473.
50	0.30	32.40	50	25.49	250.8	1.25	.32	1474.
75	0.26	32.41	75	25.50	250.0	1.88	.72	1474.
100	4.78	32.83	99	26.01	202.0	2.44	1.22	1469.
125	4.71	33.20	124	26.37	167.7	2.91	1.75	1470.
150	4.68	33.54	149	26.58	148.1	3.30	2.29	1470.
175	4.45	33.57	174	26.63	143.7	3.66	2.90	1470.
200	4.24	33.58	199	26.66	141.0	4.02	3.58	1469.
225	4.09	33.59	223	26.68	138.9	4.37	4.34	1469.
250	3.95	33.60	248	26.70	136.8	4.71	5.17	1469.
300	3.81	33.65	298	26.76	132.1	5.38	7.05	1469.
400	3.67	33.78	397	26.87	121.8	6.65	11.57	1470.
500	3.52	33.89	496	26.97	112.7	7.82	16.92	1471.
600	3.29	34.00	595	27.09	102.6	8.90	22.95	1472.
800	2.96	34.15	793	27.24	89.2	10.81	36.56	1474.
1000	2.67	34.29	990	27.37	77.0	12.48	51.80	1477.
1200	2.39	34.39	1188	27.48	67.6	13.93	68.04	1479.

TEMPERATURE, C

PRESSURE, DB

0

4

8

12

16

0

60

120

180

240

300

REF. NO. 79 - 1 - 51

50-0.0 N 145-0.0 W

MO.-1 DAY-31 GMT-17.3

31

32

33

34

35

SALINITY, P/PO

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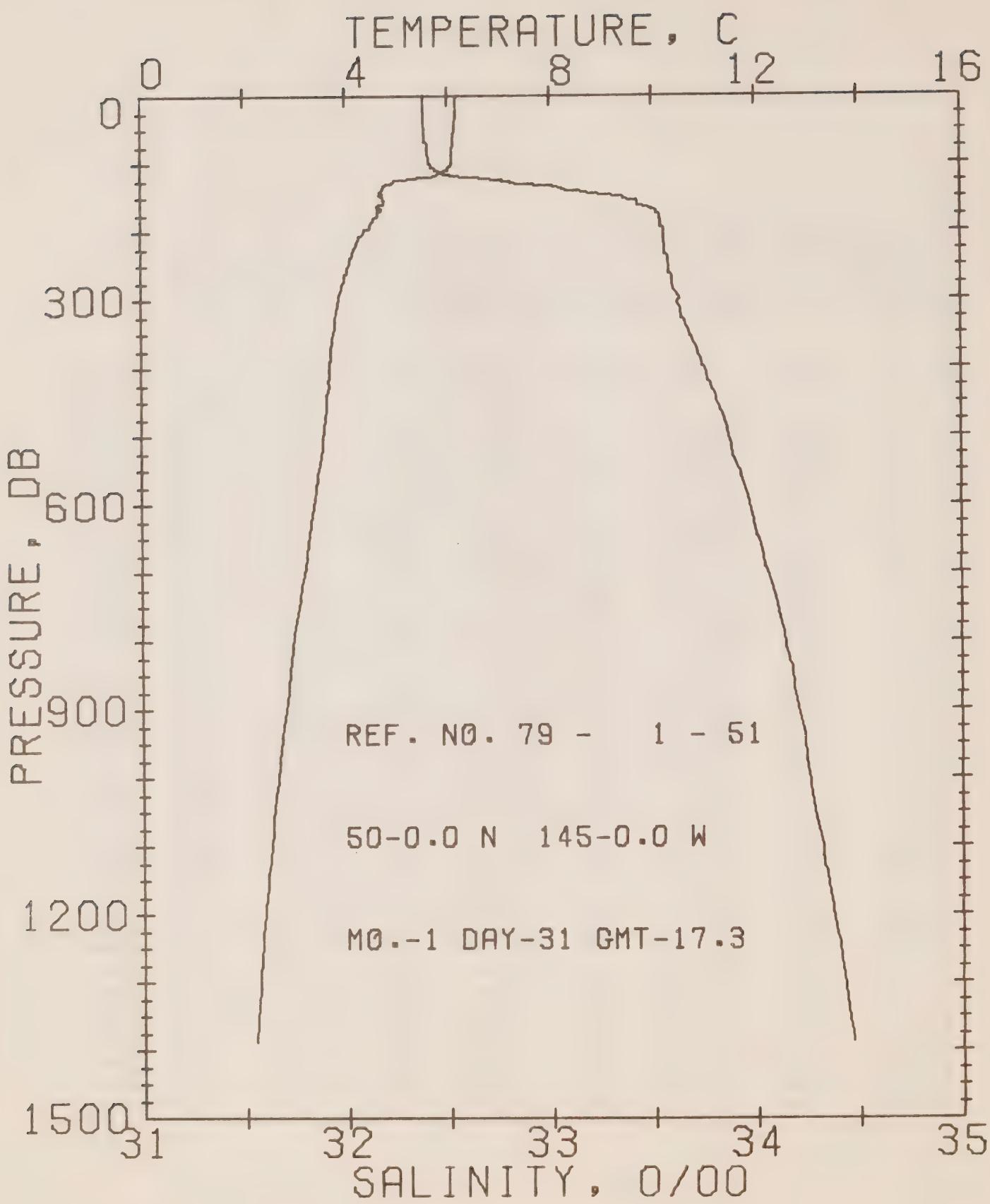
REFERENCE NO. 79- 1- 51 DATE 31/ 1/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 128 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	0.18	32.38	0	25.49	250.3	.00	.00	1472.
10	0.17	32.38	10	25.49	250.3	.25	.01	1472.
20	0.15	32.38	20	25.49	250.2	.50	.05	1473.
30	0.15	32.38	30	25.49	250.3	.75	.11	1473.
40	0.14	32.38	40	25.49	250.3	1.00	.20	1473.
50	0.13	32.39	50	25.50	249.6	1.25	.32	1473.
60	0.12	32.39	60	25.50	249.5	1.50	.46	1473.
70	0.12	32.40	70	25.51	249.2	1.75	.62	1473.
80	0.08	32.40	80	25.51	248.6	2.00	.81	1473.
90	0.08	32.40	89	25.52	248.3	2.25	1.03	1473.
100	0.07	32.41	99	25.52	247.9	2.50	1.27	1474.
110	5.96	32.44	109	25.56	244.4	2.74	1.53	1473.
120	5.65	32.56	119	25.69	232.0	2.98	1.81	1472.
130	4.81	32.90	129	26.06	197.3	3.19	2.08	1470.
140	4.70	33.08	139	26.21	182.7	3.38	2.34	1469.
150	4.74	33.30	149	26.43	162.3	3.55	2.59	1470.
160	4.74	33.43	159	26.48	157.1	3.71	2.84	1470.
170	4.66	33.51	169	26.56	150.0	3.86	3.10	1470.
180	4.57	33.53	179	26.58	148.0	4.01	3.37	1470.
190	4.48	33.54	189	26.60	146.4	4.16	3.64	1470.
200	4.35	33.55	199	26.62	144.4	4.30	3.93	1470.
210	4.26	33.55	209	26.63	143.5	4.45	4.23	1469.
220	4.19	33.56	218	26.64	142.4	4.59	4.55	1469.
230	4.13	33.56	228	26.65	141.6	4.73	4.87	1469.
240	4.08	33.57	238	26.66	140.5	4.87	5.21	1469.
250	4.05	33.58	248	26.67	139.5	5.01	5.56	1469.
260	4.01	33.58	258	26.68	139.1	5.15	5.92	1469.
270	3.97	33.59	268	26.69	138.0	5.29	6.30	1469.
280	3.92	33.59	278	26.70	137.2	5.43	6.68	1469.
290	3.88	33.61	288	26.72	135.7	5.57	7.08	1469.
300	3.86	33.63	298	26.73	134.3	5.70	7.49	1469.



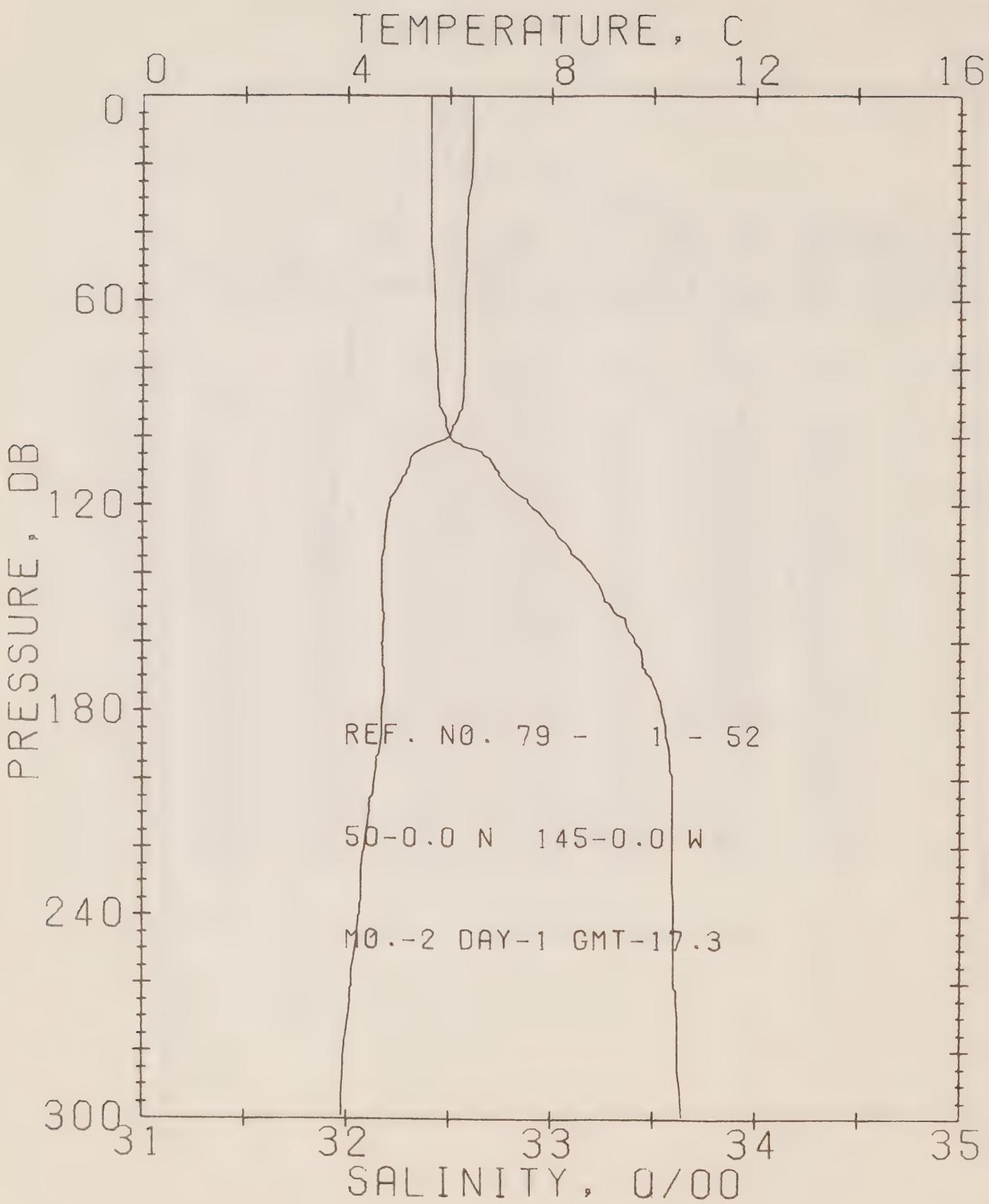
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REFERENCE NO. 79-1-51 DATE 31/1/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 208 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.18	32.38	0	25.49	250.3	.00	.00	1472.
10	6.17	32.38	10	25.49	250.3	.25	.01	1472.
20	6.15	32.38	20	25.49	250.2	.50	.05	1473.
30	6.15	32.38	30	25.49	250.3	.75	.11	1473.
50	6.13	32.39	50	25.50	249.6	1.25	.32	1473.
75	6.10	32.40	75	25.51	248.7	1.87	.72	1473.
100	6.07	32.41	99	25.52	247.9	2.50	1.27	1474.
125	4.97	32.77	124	25.94	208.7	3.09	1.95	1470.
150	4.74	33.36	149	26.43	162.3	3.55	2.59	1470.
175	4.64	33.53	174	26.57	148.7	3.94	3.23	1470.
200	4.35	33.55	199	26.62	144.4	4.30	3.93	1470.
225	4.16	33.56	223	26.65	141.8	4.66	4.71	1469.
250	4.05	33.58	248	26.67	139.5	5.01	5.56	1469.
300	3.86	33.63	298	26.73	134.3	5.70	7.49	1469.
400	3.69	33.74	397	26.84	124.5	7.00	12.11	1470.
500	3.50	33.87	496	26.95	114.8	8.19	17.58	1472.
600	3.37	33.97	595	27.05	105.8	9.30	23.76	1473.
800	2.94	34.14	793	27.22	90.4	11.26	37.72	1474.
1000	2.64	34.26	990	27.35	79.3	12.95	53.19	1476.
1200	2.37	34.37	1188	27.46	68.9	14.43	69.75	1479.



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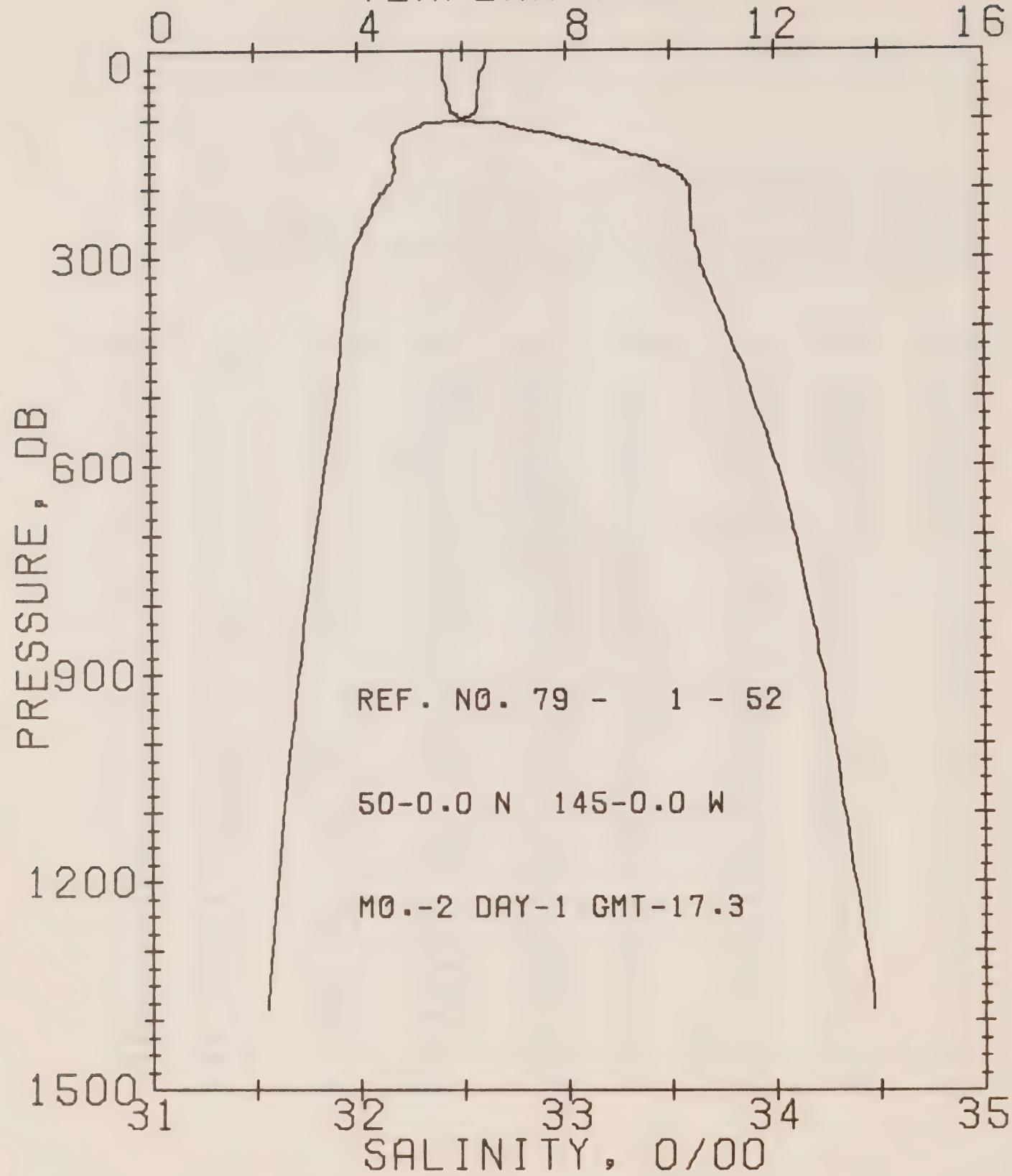
REFERENCE NO. 79- 1- 52 DATE 1/ 2/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 119 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.46	32.41	0	25.48	251.4	.00	.00	1474.
10	6.45	32.41	10	25.48	251.4	.25	.01	1474.
20	6.44	32.41	20	25.48	251.5	.50	.05	1474.
30	6.36	32.41	30	25.49	250.6	.75	.12	1474.
40	6.33	32.41	40	25.49	250.3	1.00	.20	1474.
50	6.32	32.42	50	25.50	249.7	1.25	.32	1474.
60	6.30	32.43	60	25.51	248.7	1.50	.46	1474.
70	6.30	32.43	70	25.51	248.8	1.75	.62	1474.
80	6.29	32.44	80	25.52	248.0	2.00	.81	1474.
90	6.25	32.45	89	25.53	247.0	2.25	1.03	1474.
100	6.00	32.50	99	25.60	240.3	2.49	1.26	1473.
110	5.14	32.74	109	25.89	212.7	2.72	1.50	1470.
120	4.81	32.89	119	26.05	197.6	2.92	1.74	1469.
130	4.72	33.05	129	26.19	185.0	3.11	1.99	1469.
140	4.67	33.19	139	26.30	174.2	3.29	2.23	1470.
150	4.70	33.30	149	26.39	166.3	3.46	2.49	1470.
160	4.70	33.41	159	26.47	158.2	3.62	2.74	1470.
170	4.72	33.49	169	26.53	152.5	3.78	3.00	1471.
180	4.67	33.54	179	26.58	148.3	3.93	3.27	1471.
190	4.64	33.57	189	26.61	145.9	4.08	3.55	1471.
200	4.52	33.59	199	26.63	143.2	4.22	3.83	1470.
210	4.42	33.59	209	26.65	142.2	4.36	4.13	1470.
220	4.33	33.59	218	26.65	141.4	4.51	4.44	1470.
230	4.27	33.59	228	26.66	140.8	4.65	4.77	1470.
240	4.23	33.60	238	26.67	139.7	4.79	5.10	1470.
250	4.15	33.60	248	26.68	139.0	4.93	5.45	1470.
260	4.07	33.60	258	26.69	138.2	5.06	5.81	1470.
270	4.01	33.62	268	26.71	136.5	5.20	6.18	1469.
280	3.94	33.62	278	26.72	135.5	5.34	6.56	1469.
290	3.91	33.63	288	26.73	134.7	5.47	6.96	1469.
300	3.89	33.64	298	26.74	133.7	5.61	7.36	1469.

TEMPERATURE, C



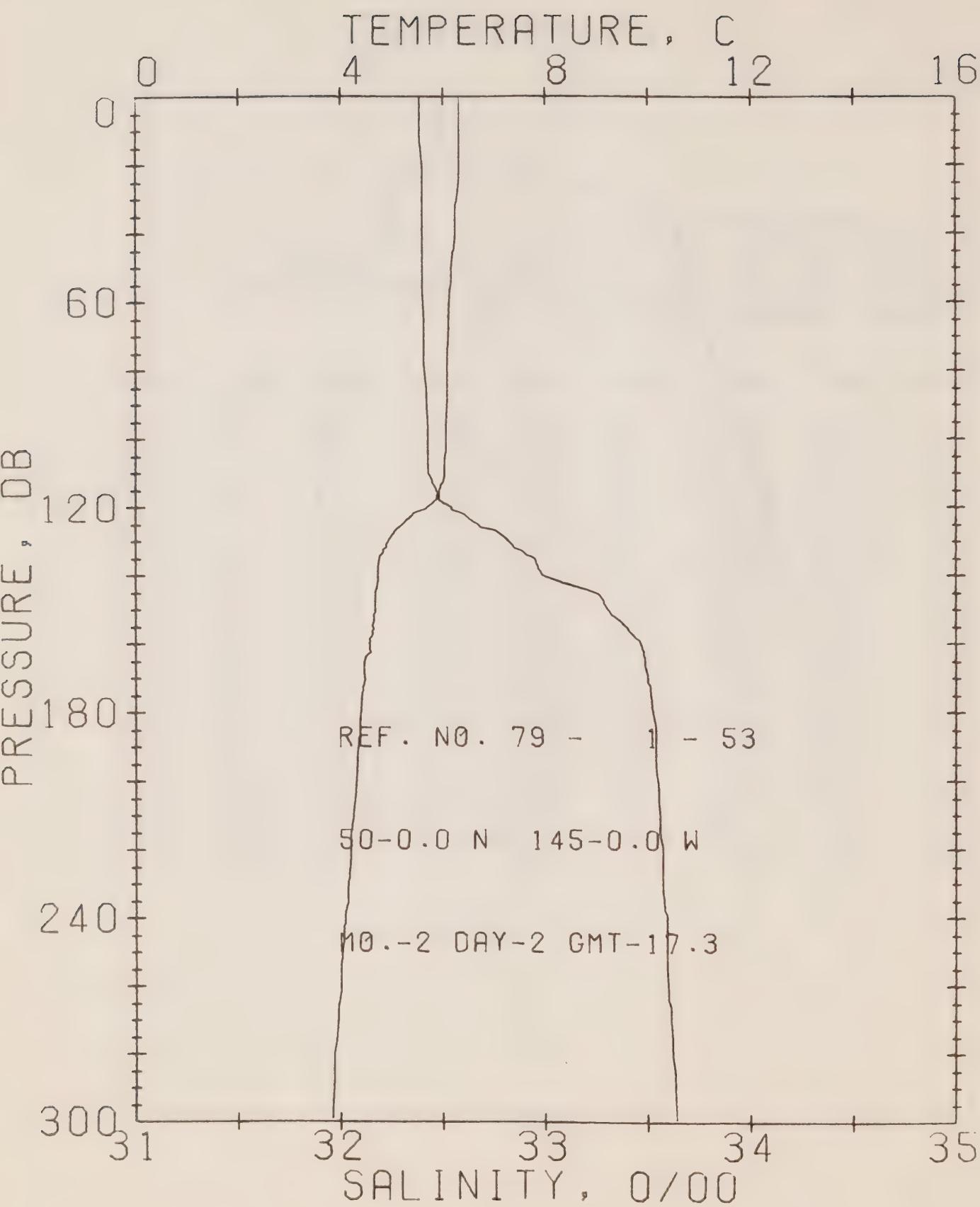
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REFERENCE NO. 79- 1- 52 DATE 1/ 2/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 165 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.46	32.41	0	25.48	251.4	.00	.00	1474.
10	6.45	32.41	10	25.48	251.4	.25	.01	1474.
20	6.44	32.41	20	25.48	251.5	.50	.05	1474.
30	6.36	32.41	30	25.49	250.6	.75	.12	1474.
50	6.32	32.42	50	25.50	249.7	1.25	.32	1474.
75	6.30	32.43	75	25.51	248.6	1.88	.72	1474.
100	6.00	32.50	99	25.60	240.3	2.49	1.26	1473.
125	4.76	32.98	124	26.13	190.7	3.02	1.87	1469.
150	4.70	33.30	149	26.39	166.3	3.46	2.49	1470.
175	4.71	33.52	174	26.56	150.2	3.86	3.14	1471.
200	4.52	33.59	199	26.63	143.2	4.22	3.83	1470.
225	4.29	33.59	223	26.66	140.9	4.58	4.60	1470.
250	4.15	33.60	248	26.68	139.0	4.93	5.45	1470.
300	3.89	33.64	298	26.74	133.7	5.61	7.36	1469.
400	3.69	33.76	397	26.86	123.2	6.90	11.94	1470.
500	3.56	33.89	496	26.97	113.2	8.07	17.34	1472.
600	3.34	34.00	595	27.08	103.0	9.15	23.39	1473.
800	2.96	34.16	793	27.24	88.7	11.07	36.99	1474.
1000	2.67	34.28	990	27.36	77.7	12.73	52.23	1477.
1200	2.40	34.38	1188	27.47	68.4	14.20	68.61	1479.



OFFSHORE OCEANOGRAPHY GROUP

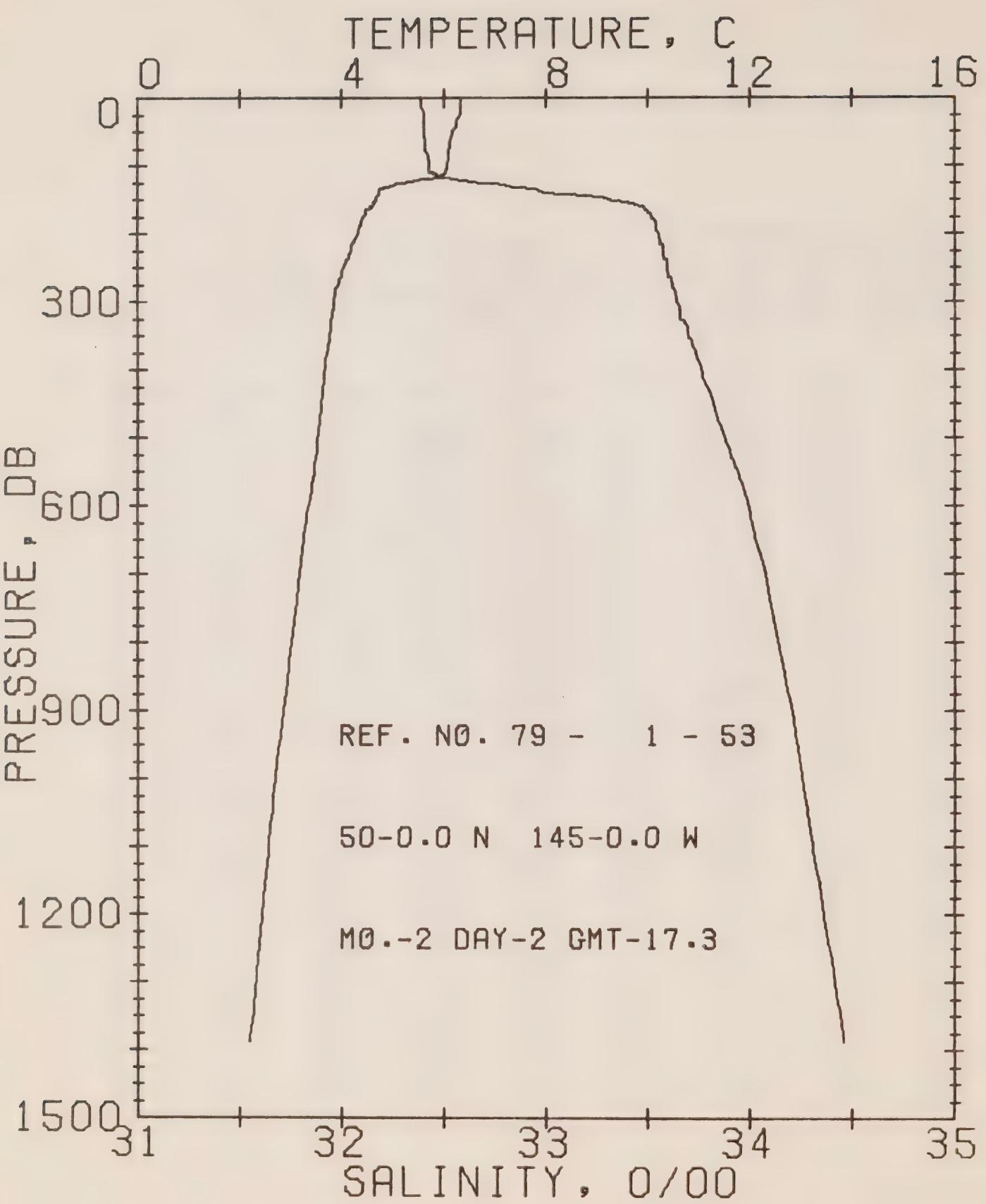
REFERENCE NO. 79- 1- 53 DATE 2/ 2/79

POSITION 50- .0N, 145- .0W GM1 17.3 STATION P

RESULTS OF STP CAST 127 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.33	32.39	0	25.48	251.3	.00	.00	1473.
10	6.31	32.39	10	25.48	251.2	.25	.01	1473.
20	6.31	32.40	20	25.49	250.7	.50	.05	1473.
30	6.28	32.40	30	25.49	250.3	.75	.12	1473.
40	6.24	32.40	40	25.50	250.0	1.00	.20	1473.
50	6.17	32.40	50	25.50	249.2	1.25	.32	1473.
60	6.13	32.40	60	25.51	248.6	1.50	.46	1473.
70	6.11	32.41	70	25.52	248.0	1.75	.62	1473.
80	6.09	32.41	80	25.52	247.7	2.00	.81	1473.
90	6.07	32.42	89	25.53	246.9	2.24	1.03	1473.
100	6.05	32.43	99	25.54	246.1	2.49	1.27	1473.
110	6.02	32.43	109	25.55	245.9	2.74	1.53	1474.
120	5.71	32.54	119	25.67	234.1	2.98	1.81	1473.
130	4.93	32.82	129	25.99	204.1	3.20	2.09	1470.
140	4.71	32.99	139	26.14	189.6	3.39	2.36	1469.
150	4.67	33.31	149	26.40	165.3	3.57	2.62	1470.
160	4.57	33.47	159	26.53	152.3	3.73	2.87	1470.
170	4.46	33.50	169	26.57	149.0	3.88	3.12	1470.
180	4.40	33.53	179	26.60	146.5	4.02	3.38	1469.
190	4.33	33.54	189	26.61	144.8	4.17	3.66	1469.
200	4.30	33.55	199	26.62	144.0	4.31	3.94	1469.
210	4.24	33.56	209	26.64	142.6	4.46	4.24	1469.
220	4.19	33.57	218	26.65	141.3	4.60	4.55	1469.
230	4.14	33.57	228	26.66	140.9	4.74	4.88	1469.
240	4.08	33.59	238	26.68	139.0	4.88	5.21	1469.
250	4.02	33.59	248	26.69	138.4	5.02	5.56	1469.
260	3.99	33.60	258	26.70	137.5	5.16	5.92	1469.
270	3.94	33.61	268	26.71	136.2	5.29	6.29	1469.
280	3.88	33.62	278	26.72	134.9	5.43	6.67	1469.
290	3.86	33.63	288	26.74	133.8	5.56	7.06	1469.
300	3.84	33.64	298	26.75	133.1	5.70	7.46	1469.

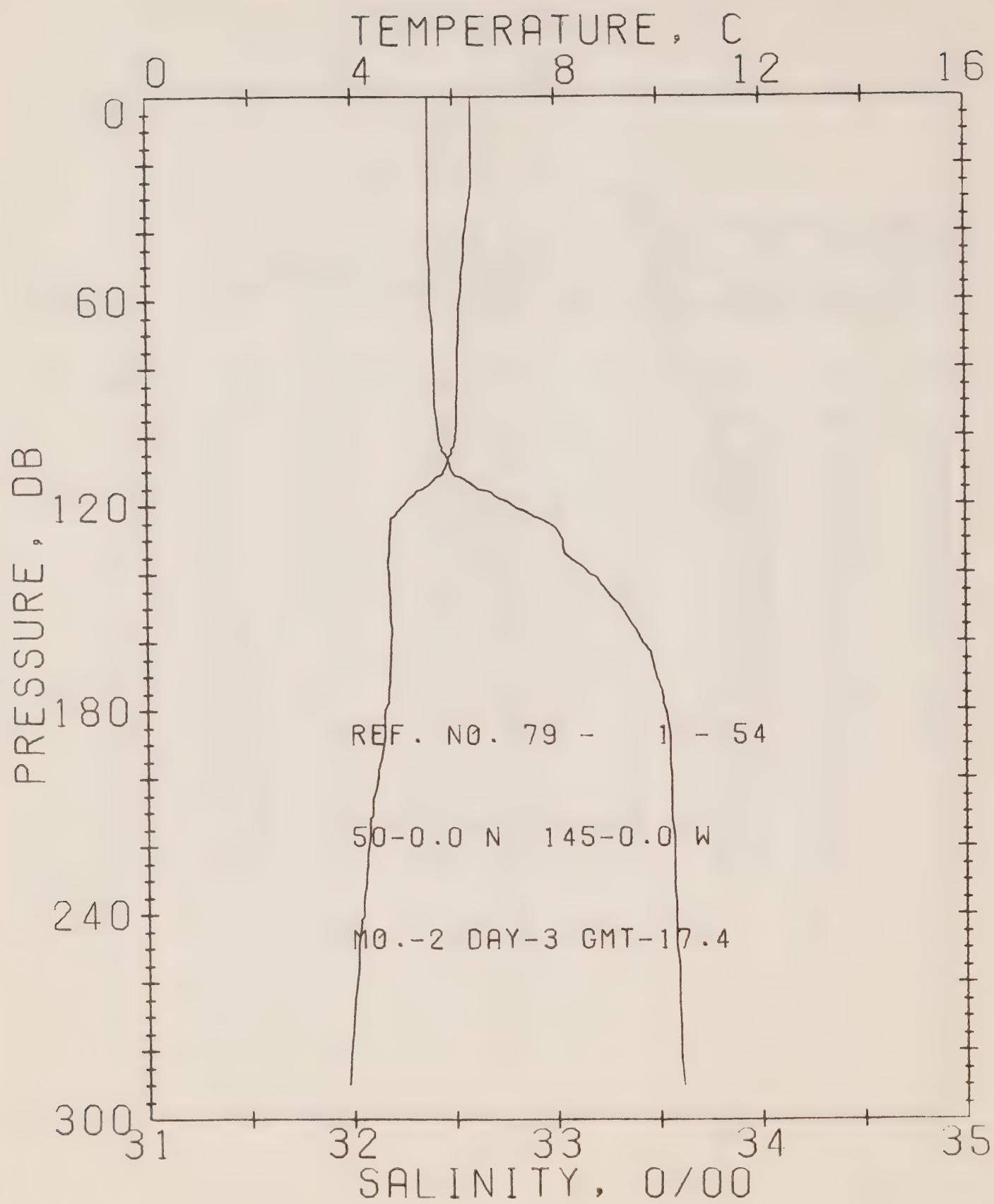


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REFERENCE NO. 79- 1- 53 DATE 2/ 2/79

POSITION 50° .0N, 145° .0W GMT 17.3 STATION P
RESULTS OF STP CAST 201 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.33	32.39	0	25.48	251.3	.00	.00	1473.
10	6.31	32.39	10	25.48	251.2	.25	.01	1473.
20	6.31	32.40	20	25.49	250.7	.50	.05	1473.
30	6.28	32.40	30	25.49	250.3	.75	.12	1473.
50	6.17	32.40	50	25.50	249.2	1.25	.32	1473.
75	6.10	32.41	75	25.52	247.9	1.87	.71	1473.
100	6.05	32.43	99	25.54	246.1	2.49	1.26	1473.
125	5.20	32.67	124	25.83	218.7	3.09	1.95	1471.
150	4.67	33.31	149	26.40	165.3	3.57	2.62	1470.
175	4.42	33.51	174	26.59	147.4	3.95	3.25	1469.
200	4.30	33.55	199	26.62	144.0	4.31	3.94	1469.
225	4.18	33.57	223	26.66	141.3	4.67	4.71	1469.
250	4.02	33.59	248	26.69	138.4	5.02	5.56	1469.
300	3.84	33.64	298	26.75	133.1	5.70	7.46	1469.
400	3.67	33.76	397	26.86	123.2	6.98	12.03	1470.
500	3.54	33.87	496	26.96	114.1	8.17	17.46	1472.
600	3.34	33.99	595	27.07	103.9	9.25	23.55	1473.
800	3.01	34.13	793	27.21	91.3	11.20	37.43	1475.
1000	2.69	34.25	990	27.34	80.3	12.91	53.05	1477.
1200	2.43	34.36	1188	27.45	70.6	14.42	69.87	1479.



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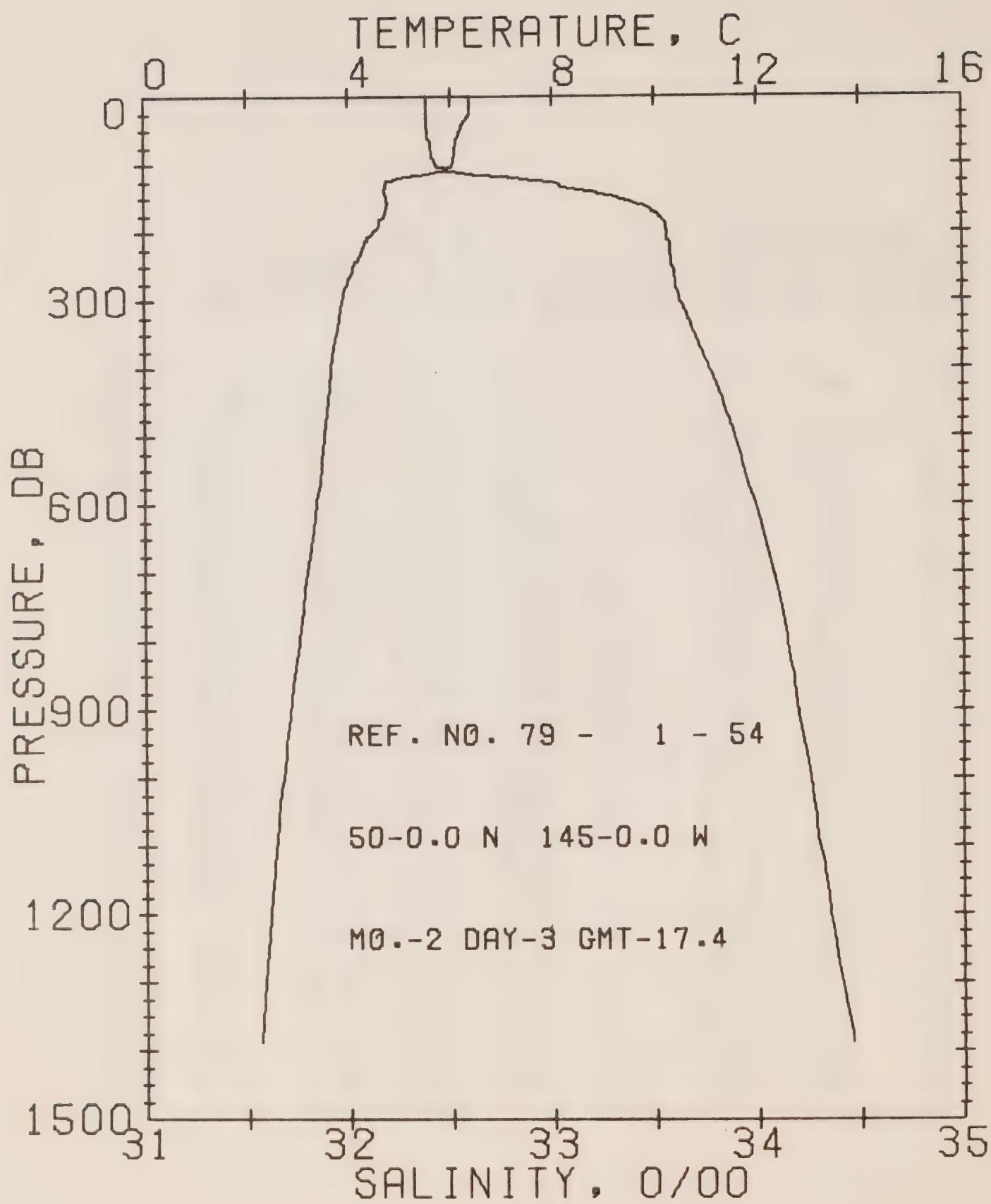
REFERENCE NO. 79- 1- 54 DATE 3/ 2/79

POSITION 50° .0N, 145° .0W GMT 17.4 STATION P

RESULTS OF STP CAST 110 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DLPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.38	32.36	0	25.46	252.7	.00	.00	1473.
10	6.38	32.36	10	25.46	252.8	.25	.01	1473.
20	6.38	32.38	20	25.46	252.9	.51	.05	1473.
30	6.34	32.38	30	25.47	252.6	.76	.12	1473.
40	6.24	32.38	40	25.48	251.5	1.01	.21	1473.
50	6.18	32.39	50	25.50	250.1	1.26	.32	1473.
60	6.13	32.39	60	25.50	249.6	1.51	.46	1473.
70	6.09	32.40	70	25.51	248.6	1.76	.63	1473.
80	6.08	32.41	80	25.52	248.1	2.01	.82	1473.
90	6.06	32.41	89	25.53	247.6	2.26	1.03	1473.
100	6.03	32.43	99	25.55	245.9	2.50	1.27	1473.
110	5.80	32.49	109	25.62	238.8	2.75	1.53	1473.
120	5.01	32.79	119	25.95	207.6	2.97	1.79	1470.
130	4.73	33.03	129	26.17	136.7	3.16	2.04	1469.
140	4.71	33.16	139	26.27	176.8	3.35	2.29	1470.
150	4.75	33.32	149	26.40	165.4	3.52	2.54	1470.
160	4.76	33.42	159	26.47	158.1	3.68	2.80	1471.
170	4.73	33.49	169	26.53	152.6	3.83	3.06	1471.
180	4.62	33.53	179	26.58	148.5	3.99	3.33	1470.
190	4.59	33.55	189	26.59	146.8	4.13	3.61	1470.
200	4.47	33.56	199	26.62	144.9	4.28	3.90	1470.
210	4.37	33.56	209	26.63	143.9	4.42	4.20	1470.
220	4.29	33.57	218	26.64	142.4	4.57	4.51	1470.
230	4.23	33.57	228	26.65	141.9	4.71	4.84	1470.
240	4.19	33.58	238	26.66	140.7	4.85	5.17	1470.
250	4.08	33.58	248	26.67	139.6	4.99	5.52	1469.
260	4.04	33.59	258	26.68	138.7	5.13	5.89	1469.
270	3.98	33.60	268	26.70	137.7	5.27	6.26	1469.
280	3.94	33.60	278	26.70	137.0	5.40	6.64	1469.
290	3.90	33.61	288	26.71	136.0	5.54	7.04	1469.
300	3.86	33.62	298	26.73	135.0	5.68	7.45	1469.



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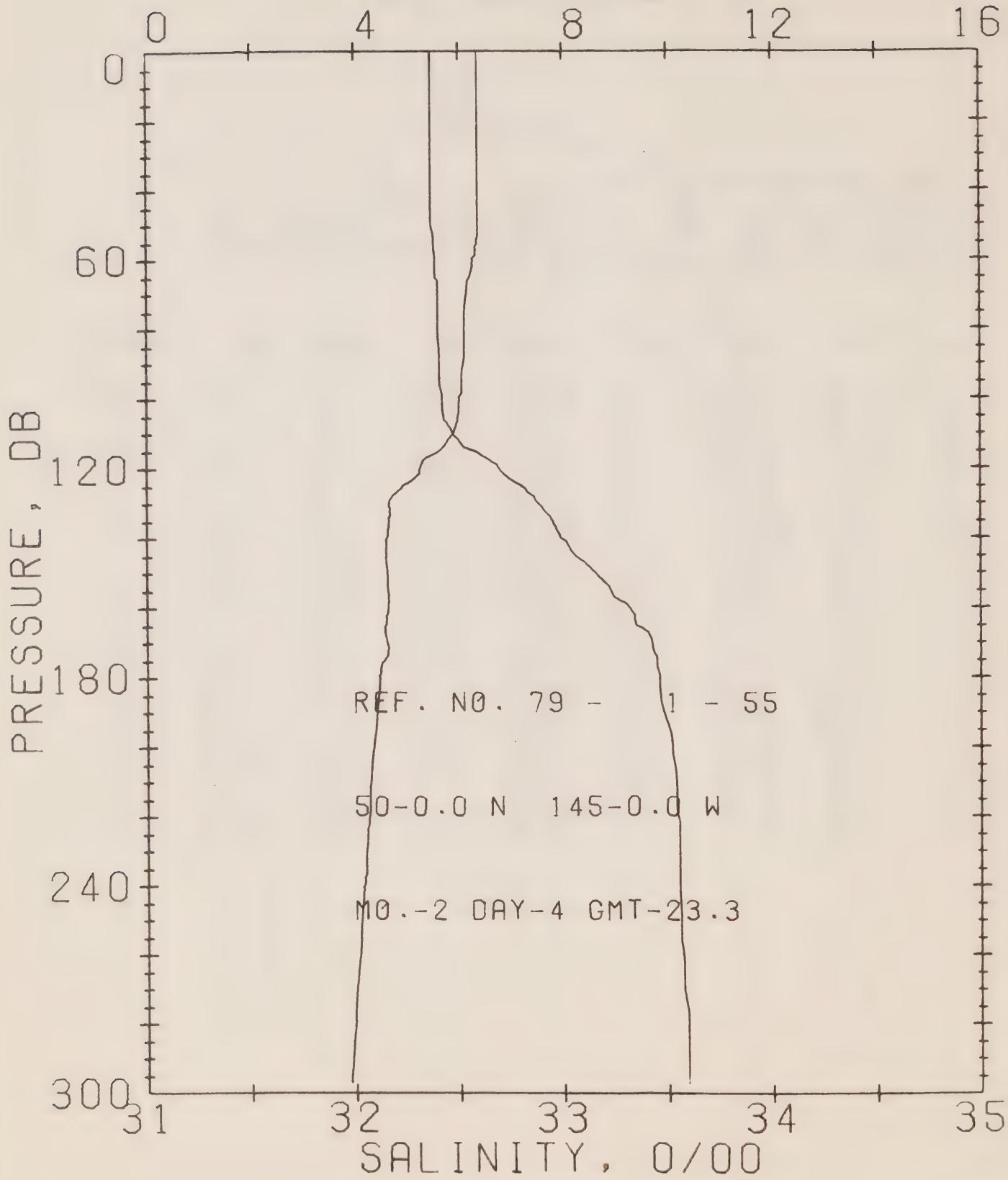
REFERENCE NO. 79- 1- 54 DATE 3/ 2/79

POSITION 50- .0N, 145- .0W GMT 17.4 STATION P

RESULTS OF STP CAST 168 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.38	32.38	0	25.46	252.7	.00	.00	1473.
10	6.38	32.38	10	25.46	252.8	.25	.01	1473.
20	6.38	32.38	20	25.46	252.9	.51	.05	1473.
30	6.34	32.38	30	25.47	252.6	.76	.12	1473.
50	6.18	32.39	50	25.50	250.1	1.26	.32	1473.
75	6.08	32.40	75	25.52	248.5	1.88	.72	1473.
100	6.03	32.43	99	25.55	245.9	2.50	1.27	1473.
125	4.75	32.96	124	26.11	192.2	3.07	1.92	1469.
150	4.75	33.32	149	26.40	165.4	3.52	2.54	1470.
175	4.69	33.51	174	26.56	150.4	3.91	3.19	1471.
200	4.47	33.56	199	26.62	144.9	4.28	3.90	1470.
225	4.26	33.57	223	26.65	142.2	4.64	4.67	1470.
250	4.08	33.58	248	26.57	139.6	4.99	5.52	1469.
300	3.86	33.62	298	26.73	135.0	5.68	7.45	1469.
400	3.65	33.76	397	26.86	122.8	6.97	12.04	1470.
500	3.52	33.89	496	26.97	112.9	8.14	17.42	1472.
600	3.36	33.99	595	27.07	104.6	9.23	23.52	1473.
800	3.01	34.14	793	27.22	90.8	11.17	37.33	1475.
1000	2.70	34.25	990	27.34	80.4	12.89	53.01	1477.
1200	2.43	34.35	1188	27.44	71.1	14.40	69.93	1479.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 55 DATE 4/ 2/79

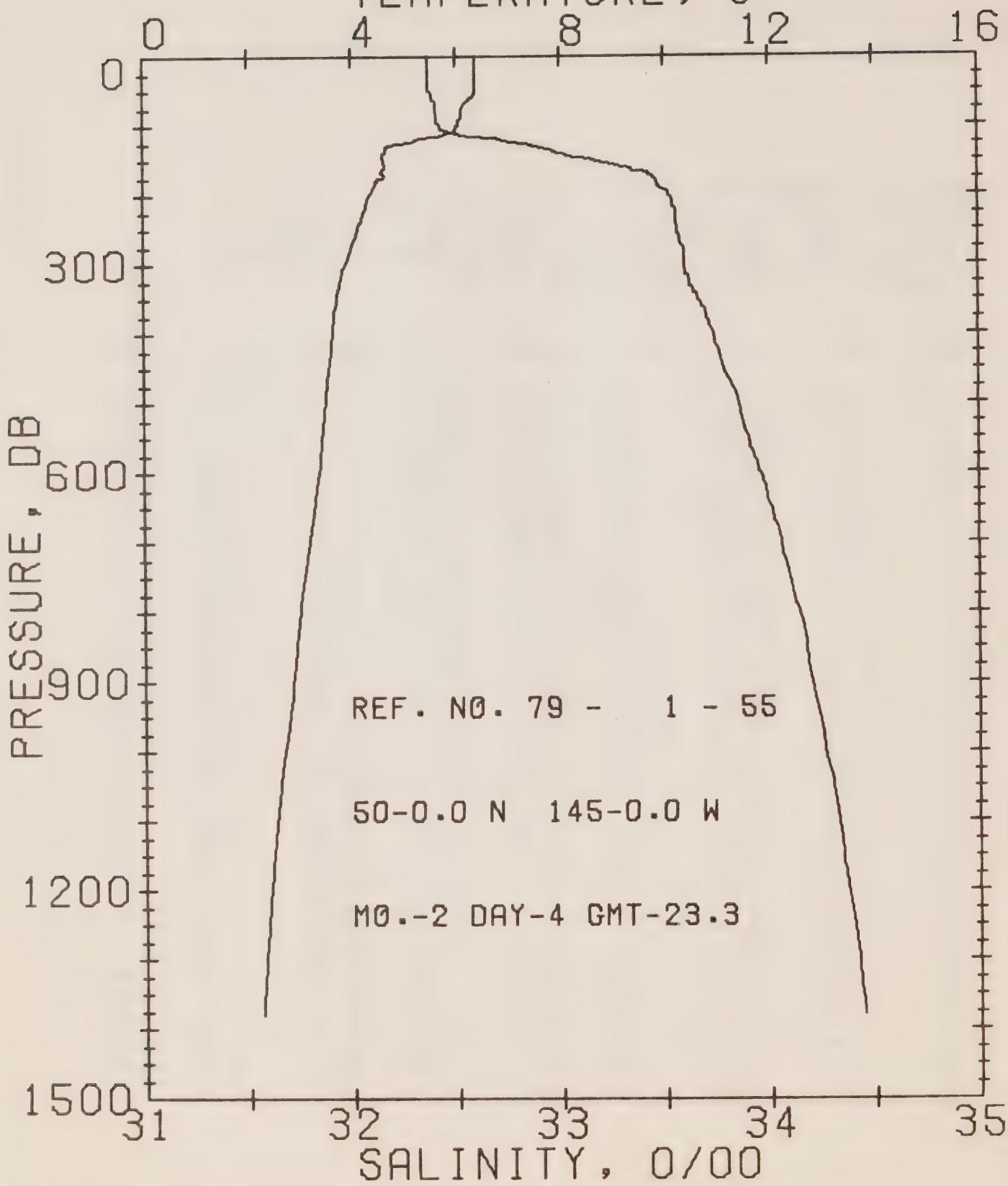
POSITION 50° .0N, 145° .0W GMT 23.3 STATION P

RESULTS OF STP CAST 123 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.37	32.37	0	25.46	253.3	.00	.00	1473.
10	6.37	32.37	10	25.46	253.4	.25	.01	1473.
20	6.37	32.37	20	25.46	253.6	.51	.05	1473.
30	6.37	32.37	30	25.46	253.7	.76	.12	1474.
40	6.37	32.37	40	25.46	253.8	1.01	.21	1474.
50	6.37	32.37	50	25.46	253.9	1.27	.32	1474.
60	6.26	32.39	60	25.49	251.2	1.52	.47	1474.
70	6.15	32.40	70	25.51	249.2	1.77	.63	1473.
80	6.10	32.40	80	25.51	248.8	2.02	.82	1473.
90	6.08	32.41	89	25.52	247.9	2.27	1.04	1473.
100	6.01	32.42	99	25.54	246.4	2.52	1.28	1473.
110	5.89	32.47	109	25.59	241.4	2.76	1.54	1473.
120	5.25	32.69	119	25.84	217.7	2.99	1.81	1471.
130	4.65	32.88	129	26.06	197.1	3.20	2.07	1469.
140	4.62	32.99	139	26.15	188.6	3.39	2.34	1469.
150	4.60	33.15	149	26.28	176.5	3.57	2.61	1469.
160	4.62	33.31	159	26.40	164.6	3.74	2.88	1470.
170	4.59	33.42	169	26.50	156.0	3.90	3.14	1470.
180	4.45	33.46	179	26.54	152.0	4.06	3.42	1470.
190	4.40	33.48	189	26.56	150.0	4.21	3.70	1470.
200	4.34	33.52	199	26.60	146.5	4.36	4.00	1470.
210	4.29	33.54	209	26.62	144.8	4.50	4.30	1470.
220	4.25	33.55	218	26.63	143.9	4.65	4.62	1470.
230	4.20	33.55	228	26.64	143.1	4.79	4.95	1470.
240	4.15	33.55	238	26.64	142.6	4.93	5.29	1469.
250	4.10	33.56	248	26.65	141.5	5.08	5.65	1469.
260	4.05	33.57	258	26.66	140.5	5.22	6.01	1469.
270	4.00	33.57	268	26.67	139.8	5.36	6.39	1469.
280	3.97	33.59	278	26.69	138.1	5.50	6.78	1469.
290	3.93	33.59	288	26.70	137.8	5.63	7.18	1469.
300	3.87	33.59	298	26.70	137.2	5.77	7.59	1469.

TEMPERATURE, C



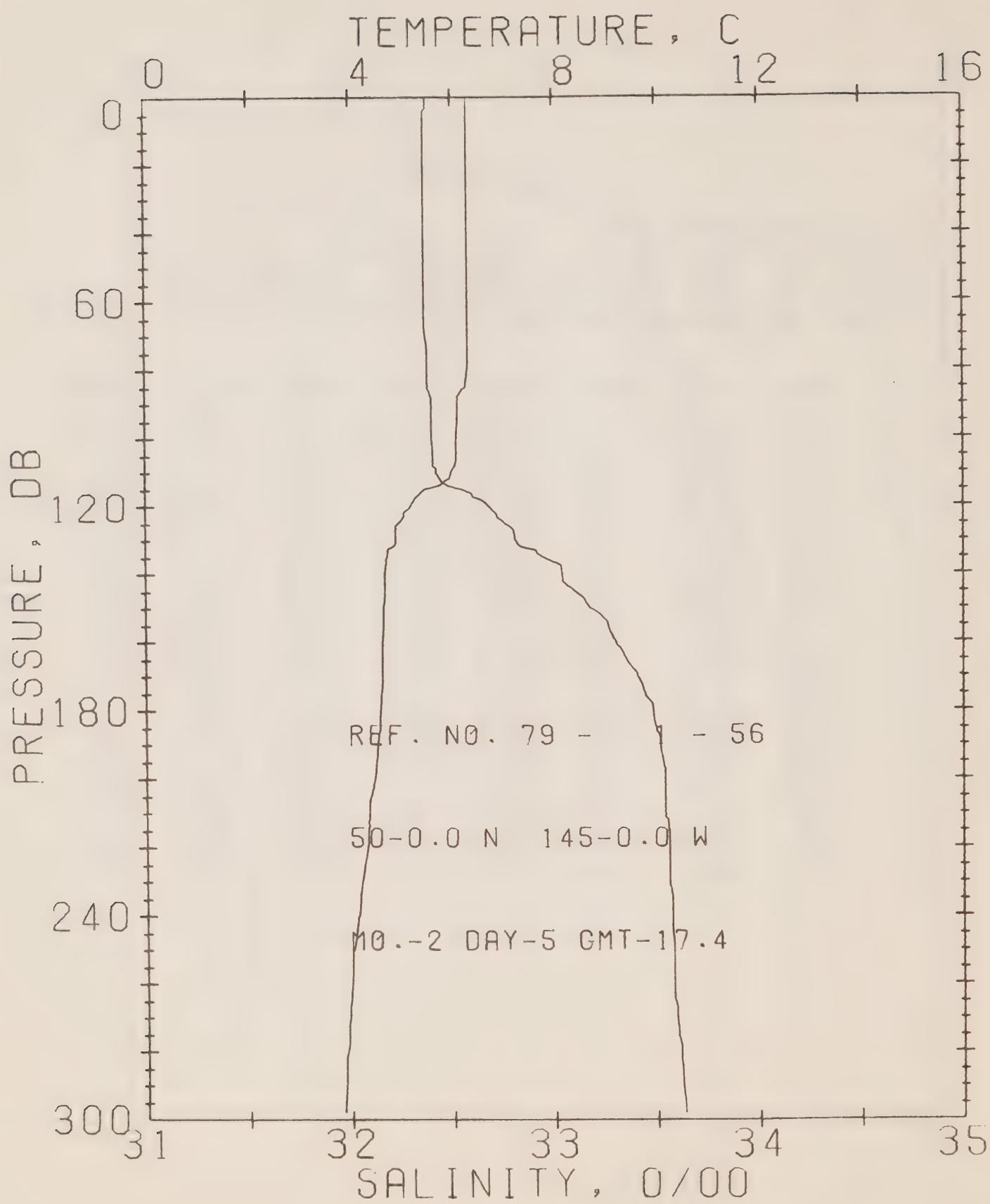
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 55 DATE 4/ 2/79

POSITION 50- .0N, 145- .0W GMT 23.3 STATION P

RESULTS OF STP CAST 201 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.37	32.37	0	25.46	253.3	.00	.00	1473.
10	6.37	32.37	10	25.46	253.4	.25	.01	1473.
20	6.37	32.37	20	25.46	253.6	.51	.05	1473.
30	6.37	32.37	30	25.46	253.7	.76	.12	1474.
50	6.37	32.37	50	25.46	253.9	1.27	.32	1474.
75	6.12	32.40	75	25.51	249.0	1.90	.72	1473.
100	6.01	32.42	99	25.54	246.4	2.52	1.28	1473.
125	4.92	32.81	124	25.97	205.2	3.10	1.94	1470.
150	4.60	33.15	149	26.28	176.5	3.57	2.61	1469.
175	4.57	33.45	174	26.52	153.9	3.98	3.28	1470.
200	4.34	33.52	199	26.60	146.5	4.36	4.00	1470.
225	4.22	33.55	223	26.63	143.2	4.72	4.78	1469.
250	4.10	33.56	248	26.65	141.5	5.08	5.65	1469.
300	3.87	33.59	298	26.70	137.2	5.77	7.59	1469.
400	3.63	33.73	397	26.84	125.0	7.08	12.26	1470.
500	3.49	33.85	496	26.95	115.2	8.28	17.77	1471.
600	3.36	33.95	595	27.04	106.8	9.40	24.01	1473.
800	2.97	34.14	793	27.22	90.6	11.37	38.02	1474.
1000	2.67	34.26	990	27.35	79.1	13.07	53.58	1477.
1200	2.39	34.37	1168	27.46	69.1	14.54	70.04	1479.



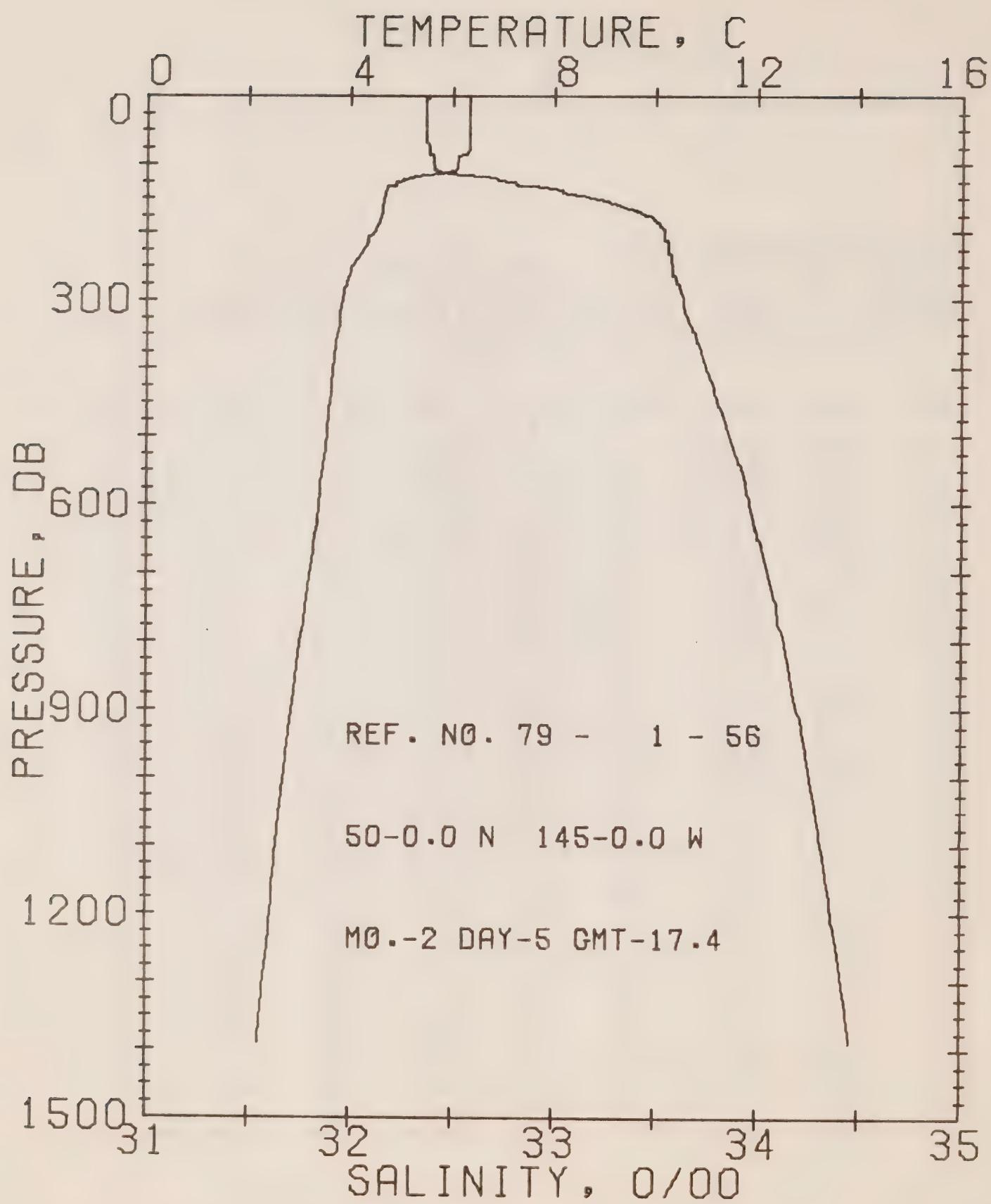
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 56 DATE 5/ 2/79

POSITION 50- .0N, 145- .0W GMT 17.4 STATION P

RESULTS OF STP CAST 124 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.32	32.38	0	25.47	252.0	.00	.00	1473.
10	6.32	32.37	10	25.46	252.8	.25	.01	1473.
20	6.32	32.37	20	25.46	253.0	.51	.05	1473.
30	6.32	32.37	30	25.46	253.1	.76	.12	1473.
40	6.32	32.37	40	25.46	253.2	1.01	.21	1474.
50	6.31	32.37	50	25.46	253.2	1.26	.32	1474.
60	6.32	32.37	60	25.46	253.4	1.52	.46	1474.
70	6.32	32.37	70	25.47	253.2	1.77	.63	1474.
80	6.30	32.38	80	25.47	252.6	2.02	.83	1474.
90	6.11	32.40	89	25.51	249.0	2.28	1.04	1474.
100	6.09	32.40	99	25.51	248.9	2.52	1.28	1474.
110	5.98	32.42	109	25.54	246.2	2.77	1.55	1473.
120	5.18	32.68	119	25.84	217.7	3.00	1.82	1471.
130	4.87	32.82	129	25.98	204.3	3.21	2.09	1470.
140	4.68	33.04	139	26.18	185.5	3.41	2.35	1469.
150	4.64	33.17	149	26.29	175.4	3.59	2.62	1470.
160	4.62	33.30	159	26.40	165.4	3.76	2.89	1470.
170	4.61	33.41	169	26.48	157.3	3.92	3.16	1470.
180	4.58	33.48	179	26.54	151.6	4.07	3.44	1470.
190	4.53	33.52	189	26.58	148.7	4.22	3.72	1470.
200	4.45	33.54	199	26.60	146.2	4.37	4.01	1470.
210	4.35	33.54	209	26.61	145.2	4.52	4.32	1470.
220	4.30	33.56	218	26.63	143.3	4.66	4.63	1470.
230	4.20	33.56	228	26.64	142.3	4.80	4.96	1470.
240	4.12	33.57	238	26.66	140.8	4.94	5.30	1469.
250	4.02	33.58	248	26.66	139.1	5.09	5.65	1469.
260	3.99	33.58	258	26.68	138.9	5.22	6.01	1469.
270	3.94	33.59	268	26.69	137.7	5.36	6.38	1469.
280	3.90	33.61	278	26.71	135.9	5.50	6.77	1469.
290	3.86	33.62	288	26.73	134.7	5.63	7.16	1469.
300	3.84	33.63	298	26.74	134.0	5.77	7.56	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 56 DATE 5/ 2/79

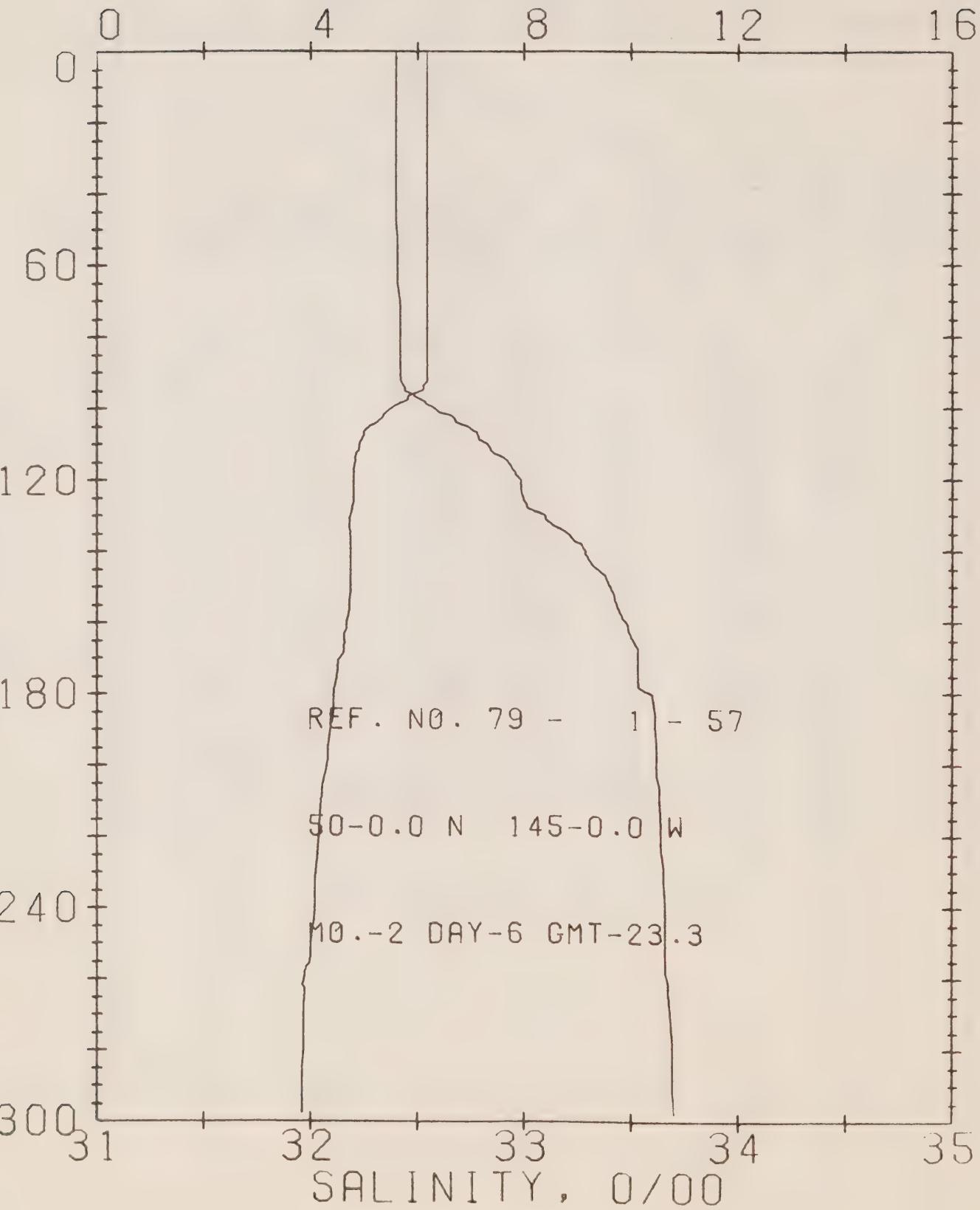
POSITION 50- .0N, 145- .0W GMT 17.4 STATION P

RESULTS OF STP CAST 206 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	0.32	32.38	0	25.47	252.0	.00	.00	1473.
10	0.32	32.37	10	25.46	252.8	.25	.01	1473.
20	0.32	32.37	20	25.46	253.0	.51	.05	1473.
30	0.32	32.37	30	25.46	253.1	.76	.12	1473.
50	0.31	32.37	50	25.46	253.2	1.26	.32	1474.
75	0.32	32.38	75	25.47	252.8	1.90	.73	1474.
100	0.09	32.40	99	25.51	248.9	2.52	1.28	1474.
125	4.93	32.76	124	25.93	209.0	3.11	1.96	1470.
150	4.64	33.17	149	26.29	175.4	3.59	2.62	1470.
175	4.59	33.44	174	26.51	154.6	4.00	3.30	1470.
200	4.45	33.54	199	26.60	146.2	4.37	4.01	1470.
225	4.26	33.56	223	26.64	142.9	4.73	4.79	1470.
250	4.02	33.58	248	26.68	139.1	5.09	5.65	1469.
300	3.84	33.63	298	26.74	134.0	5.77	7.56	1469.
400	3.66	33.75	397	26.85	124.2	7.06	12.17	1470.
500	3.54	33.86	496	26.95	114.9	8.25	17.63	1472.
600	3.38	33.96	595	27.04	106.7	9.36	23.81	1473.
800	3.03	34.13	793	27.21	91.8	11.34	37.91	1475.
1000	2.71	34.26	990	27.34	80.0	13.06	53.60	1477.
1200	2.44	34.37	1188	27.45	70.1	14.55	70.29	1479.

TEMPERATURE, C

PRESSURE, DB



OFFSHORE OCEANOGRAPHY GROUP

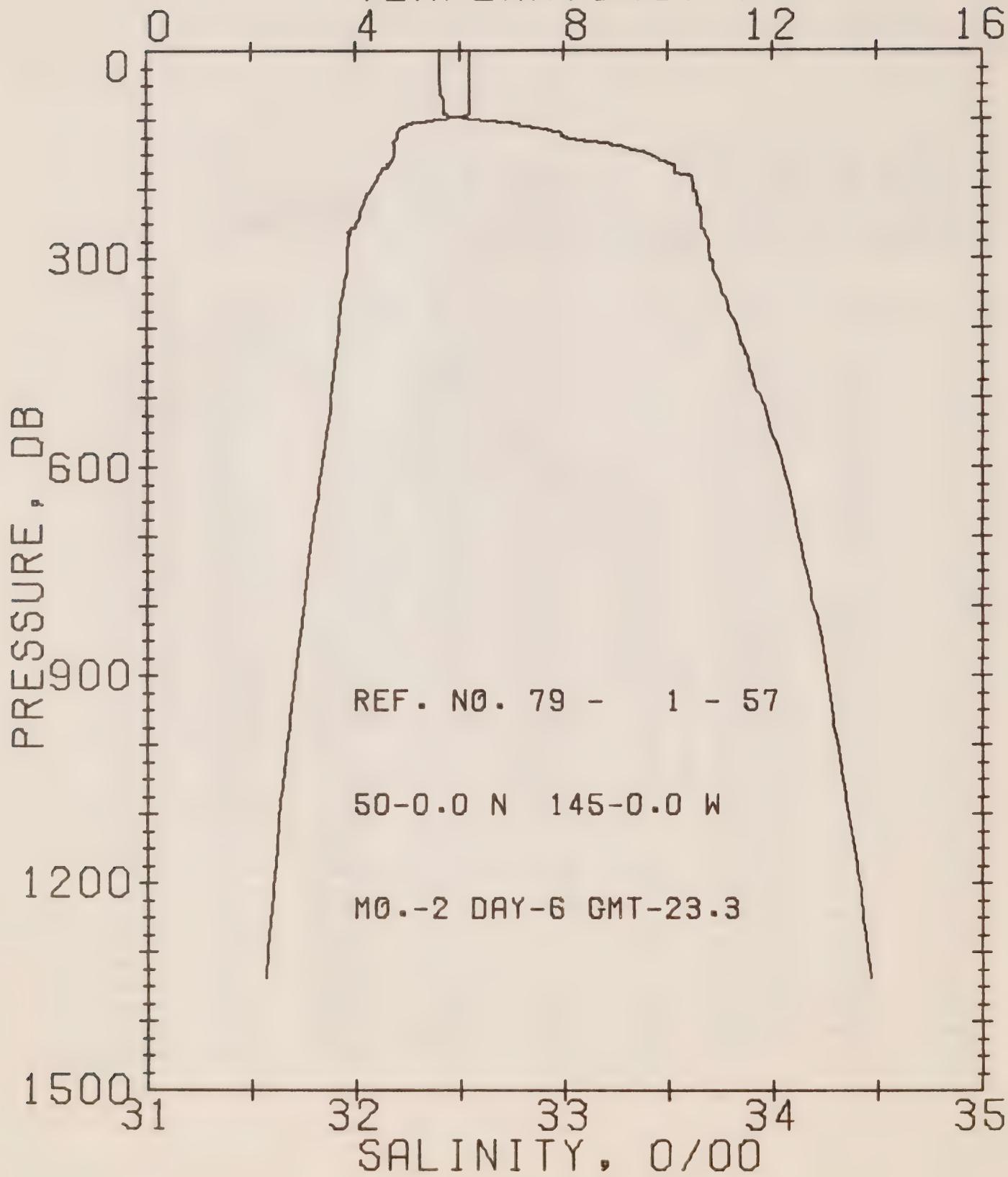
REFERENCE NO. 79- 1- 57 DATE 6/ 2/79

POSITION 50- .0N, 145- .0W GMT 23.3 STATION P

RESULTS OF STP CAST 121 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.19	32.40	0	25.50	248.9	.00	.00	1472.
10	6.19	32.40	10	25.50	249.0	.25	.01	1473.
20	6.19	32.40	20	25.50	249.2	.50	.05	1473.
30	6.19	32.40	30	25.50	249.3	.75	.11	1473.
40	6.19	32.40	40	25.50	249.4	1.00	.20	1473.
50	6.19	32.40	50	25.51	249.2	1.25	.32	1473.
60	6.19	32.41	60	25.51	248.9	1.49	.46	1473.
70	6.19	32.42	70	25.52	248.3	1.74	.62	1474.
80	6.19	32.42	80	25.52	248.3	1.99	.81	1474.
90	6.19	32.42	89	25.52	248.4	2.24	1.03	1474.
100	5.53	32.58	99	25.72	228.9	2.48	1.26	1472.
110	4.91	32.83	109	25.99	203.4	2.70	1.49	1470.
120	4.79	32.99	119	26.13	190.2	2.89	1.72	1469.
130	4.75	33.10	129	26.22	181.7	3.08	1.96	1470.
140	4.74	33.29	139	26.37	167.4	3.26	2.20	1470.
150	4.75	33.40	149	26.46	159.1	3.42	2.44	1470.
160	4.66	33.48	159	26.53	152.5	3.58	2.69	1470.
170	4.57	33.53	169	26.58	147.9	3.73	2.94	1470.
180	4.43	33.60	179	26.65	141.3	3.87	3.20	1470.
190	4.37	33.61	189	26.67	139.9	4.01	3.47	1470.
200	4.30	33.62	199	26.68	138.6	4.15	3.75	1470.
210	4.20	33.63	209	26.70	136.9	4.29	4.03	1469.
220	4.14	33.64	218	26.71	135.7	4.43	4.33	1469.
230	4.10	33.65	228	26.73	134.6	4.56	4.64	1469.
240	4.06	33.66	238	26.74	133.5	4.70	4.96	1469.
250	4.00	33.66	248	26.74	132.9	4.83	5.30	1469.
260	3.88	33.67	258	26.76	131.3	4.96	5.64	1469.
270	3.88	33.68	268	26.77	130.2	5.09	5.99	1469.
280	3.86	33.69	278	26.78	129.5	5.22	6.36	1469.
290	3.84	33.69	288	26.78	129.4	5.35	6.73	1469.
300	3.84	33.70	298	26.79	128.7	5.48	7.12	1469.

TEMPERATURE, C



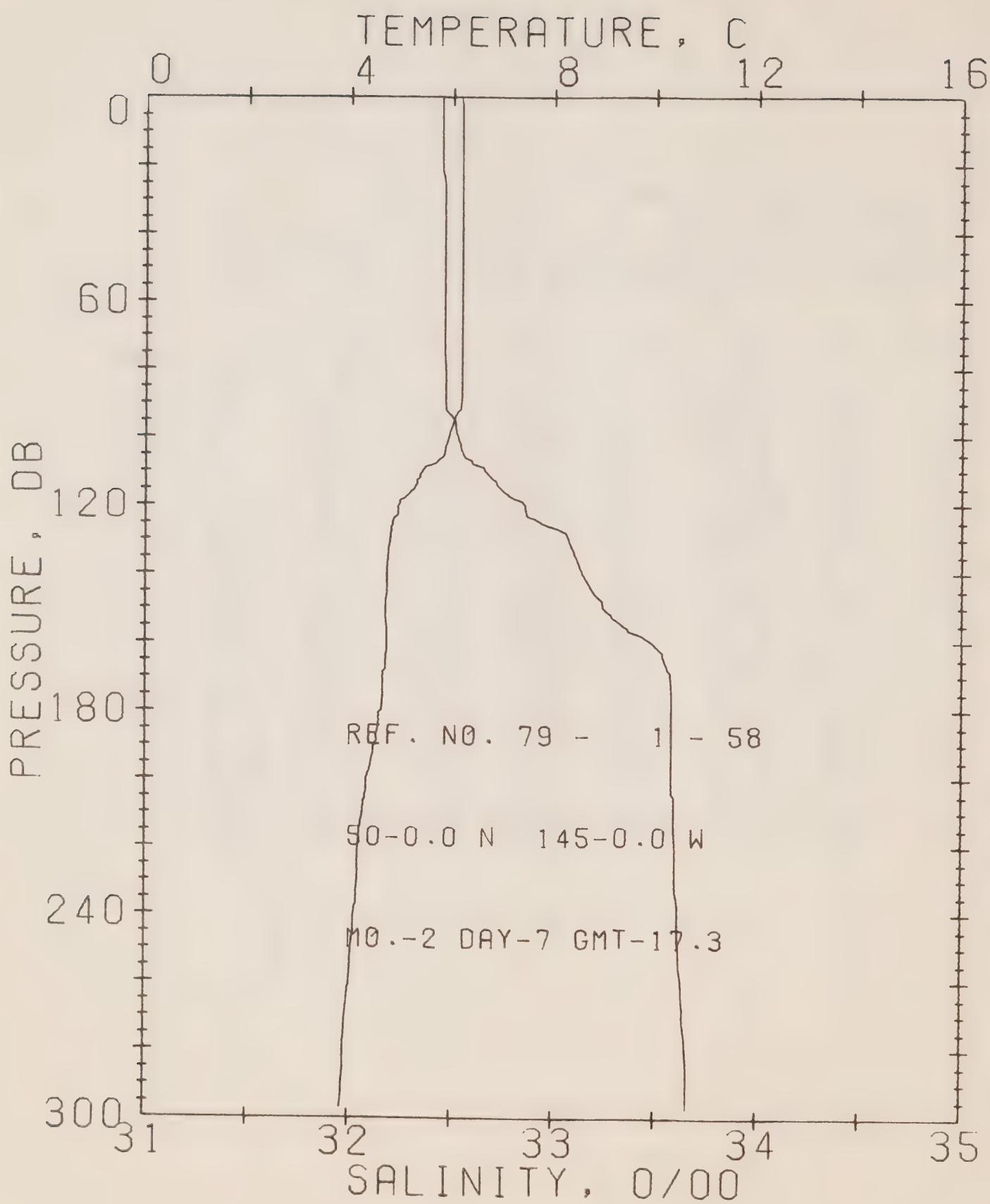
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 57 DATE 6/ 2/79

POSITION 50- .0N, 145- .0W GMT 23.3 STATION P

RESULTS OF STP CAST 167 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.19	32.40	0	25.50	248.9	.00	.00	1472.
10	6.19	32.40	10	25.50	249.0	.25	.01	1473.
20	6.19	32.40	20	25.50	249.2	.50	.05	1473.
30	6.19	32.40	30	25.50	249.3	.75	.11	1473.
50	6.19	32.40	50	25.51	249.2	1.25	.32	1473.
75	6.19	32.42	75	25.52	248.3	1.87	.71	1474.
100	5.53	32.58	99	25.72	228.9	2.48	1.26	1472.
125	4.79	33.00	124	26.14	189.8	2.99	1.84	1470.
150	4.75	33.40	149	26.46	159.1	3.42	2.44	1470.
175	4.49	33.53	174	26.59	147.1	3.80	3.07	1470.
200	4.30	33.62	199	26.68	138.6	4.15	3.75	1470.
225	4.12	33.64	223	26.72	135.3	4.50	4.49	1469.
250	4.00	33.66	248	26.74	132.9	4.83	5.30	1469.
300	3.84	33.70	298	26.79	128.7	5.48	7.12	1469.
400	3.67	33.83	397	26.91	118.0	6.72	11.53	1470.
500	3.53	33.94	496	27.01	109.2	7.86	16.75	1472.
600	3.36	34.05	595	27.11	100.1	8.91	22.60	1473.
800	2.99	34.19	793	27.26	86.8	10.77	35.85	1475.
1000	2.67	34.31	990	27.39	75.6	12.39	50.65	1477.
1200	2.42	34.41	1188	27.49	66.6	13.81	66.52	1479.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 58 DATE 7/ 2/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STD CAST 121 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.17	32.45	0	25.54	245.0	.00	.00	1472.
10	6.18	32.45	10	25.54	245.2	.25	.01	1473.
20	6.19	32.45	20	25.54	245.4	.49	.05	1473.
30	6.19	32.46	30	25.55	244.8	.74	.11	1473.
40	6.19	32.46	40	25.55	244.9	.98	.20	1473.
50	6.19	32.46	50	25.55	245.0	1.23	.31	1473.
60	6.19	32.46	60	25.55	245.1	1.47	.45	1473.
70	6.19	32.46	70	25.55	245.2	1.72	.61	1474.
80	6.19	32.47	79	25.56	244.7	1.96	.80	1474.
90	6.18	32.47	89	25.56	244.6	2.21	1.01	1474.
100	5.92	32.53	99	25.63	237.4	2.45	1.24	1473.
110	5.42	32.66	109	25.80	221.8	2.68	1.49	1471.
120	4.96	32.86	119	26.01	201.8	2.89	1.74	1470.
130	4.78	33.07	129	26.20	184.0	3.09	1.99	1470.
140	4.72	33.14	139	26.26	178.4	3.27	2.24	1470.
150	4.70	33.24	149	26.34	170.8	3.44	2.50	1470.
160	4.71	33.48	159	26.53	153.1	3.60	2.75	1470.
170	4.63	33.57	169	26.61	145.6	3.75	3.00	1470.
180	4.61	33.58	179	26.62	144.7	3.90	3.26	1470.
190	4.50	33.58	189	26.63	143.6	4.04	3.53	1470.
200	4.32	33.58	199	26.65	141.8	4.18	3.82	1470.
210	4.25	33.59	209	26.66	140.4	4.33	4.11	1469.
220	4.18	33.60	218	26.67	139.1	4.47	4.42	1469.
230	4.15	33.60	228	26.68	138.8	4.60	4.74	1469.
240	4.10	33.61	238	26.69	137.6	4.74	5.07	1469.
250	4.05	33.61	248	26.70	136.8	4.88	5.41	1469.
260	3.99	33.63	258	26.72	135.3	5.02	5.77	1469.
270	3.93	33.64	268	26.74	133.9	5.15	6.13	1469.
280	3.90	33.65	278	26.75	132.8	5.28	6.50	1469.
290	3.88	33.66	288	26.76	132.0	5.42	6.89	1469.
300	3.84	33.66	298	26.76	131.7	5.55	7.28	1469.

TEMPERATURE, C

PRESSURE, DB

300

600

900

1200

1500

4

8

12

16

REF. NO. 79 - 1 - 58

50-0.0 N 145-0.0 W

MO.-2 DAY-7 GMT-17.3

31

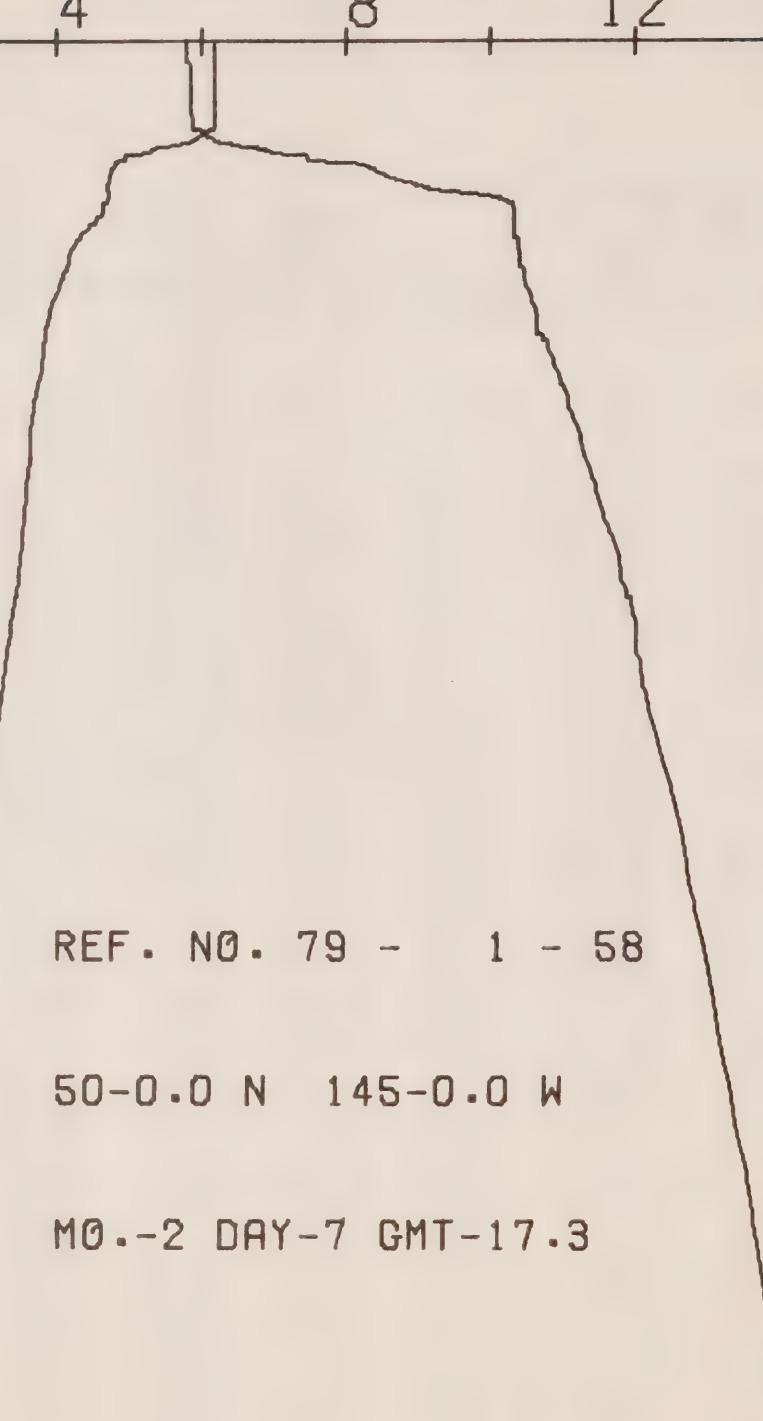
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SALINITY, 0/00



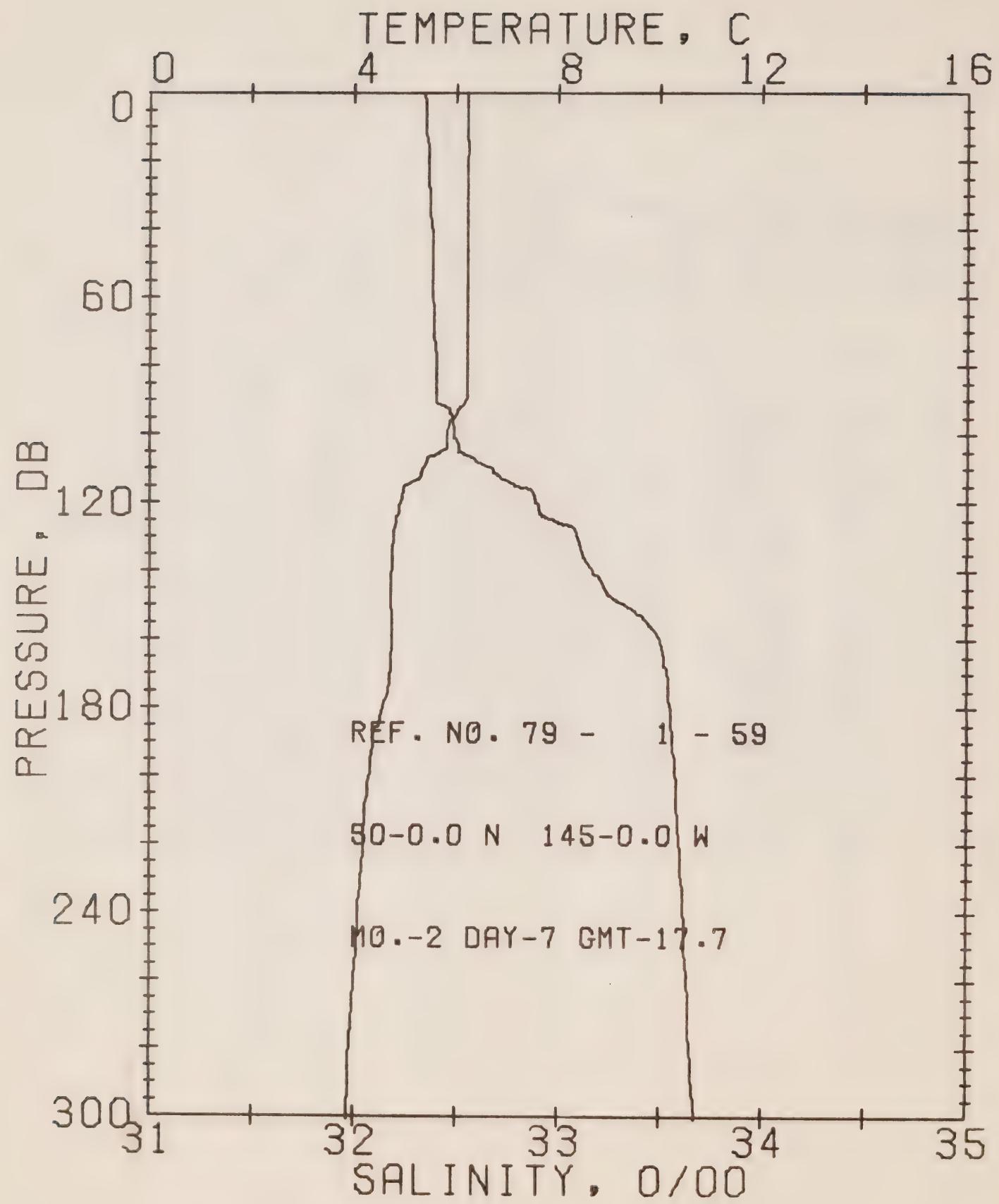
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 58 DATE 7/ 2/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 205 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.17	32.45	0	25.54	245.0	.00	.00	1472.
10	6.18	32.45	10	25.54	245.2	.25	.01	1473.
20	6.19	32.45	20	25.54	245.4	.49	.05	1473.
30	6.19	32.46	30	25.55	244.8	.74	.11	1473.
50	6.19	32.46	50	25.55	245.0	1.23	.31	1473.
75	6.19	32.46	75	25.55	245.3	1.84	.70	1474.
100	5.92	32.53	99	25.63	237.4	2.45	1.24	1473.
125	4.82	32.94	124	26.09	194.4	2.99	1.87	1470.
150	4.70	33.24	149	26.34	170.8	3.44	2.50	1470.
175	4.63	33.58	174	26.61	145.0	3.83	3.13	1470.
200	4.32	33.58	199	26.65	141.8	4.18	3.82	1470.
225	4.16	33.60	223	26.68	138.8	4.54	4.58	1469.
250	4.05	33.61	248	26.70	136.8	4.88	5.41	1469.
300	3.84	33.66	298	26.76	131.7	5.55	7.28	1469.
400	3.64	33.80	397	26.89	120.2	6.80	11.76	1470.
500	3.54	33.90	496	26.98	112.1	7.97	17.09	1472.
600	3.36	34.00	595	27.07	103.7	9.05	23.14	1473.
800	2.98	34.14	793	27.22	90.5	11.01	37.11	1474.
1000	2.67	34.27	990	27.36	78.5	12.71	52.60	1477.
1200	2.42	34.39	1188	27.47	68.0	14.17	68.98	1479.



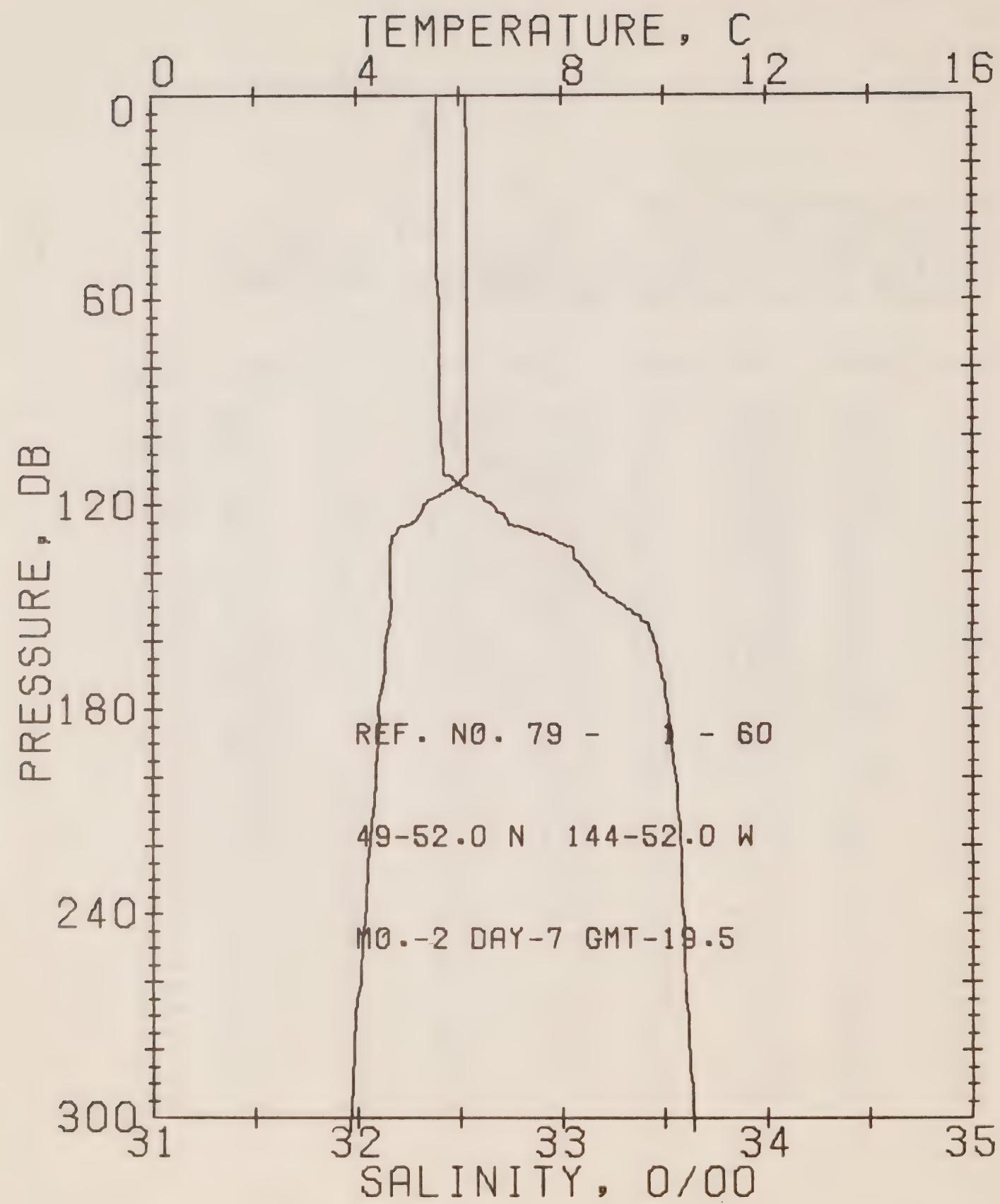
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 59

DATE 7/ 2/79

POSITION 50- .0N, 145- .0W GMT 17.7 STATION P
 RESULTS OF STP CAST 169 POINTS TAKEN FROM ANALOG TRACE
 GUILDLINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.22	32.34	0	25.45	253.8	.00	.00	1472.
10	6.22	32.35	10	25.46	253.1	.25	.01	1473.
20	6.22	32.36	20	25.47	252.5	.51	.05	1473.
30	6.22	32.37	30	25.47	252.0	.76	.12	1473.
40	6.22	32.38	40	25.48	251.4	1.01	.21	1473.
50	6.22	32.38	50	25.48	251.3	1.26	.32	1473.
60	6.22	32.38	60	25.48	251.2	1.51	.46	1473.
70	6.22	32.39	70	25.49	250.8	1.76	.63	1474.
80	6.22	32.40	80	25.50	250.2	2.01	.82	1474.
90	6.19	32.40	89	25.50	249.9	2.26	1.04	1474.
100	5.81	32.49	99	25.62	238.9	2.51	1.27	1473.
110	5.33	32.67	109	25.82	220.0	2.74	1.52	1471.
120	4.91	32.89	119	26.04	199.0	2.95	1.76	1470.
130	4.77	33.09	129	26.21	182.7	3.14	2.01	1470.
140	4.74	33.16	139	26.27	177.1	3.32	2.26	1470.
150	4.73	33.33	149	26.41	164.4	3.49	2.51	1470.
160	4.74	33.49	159	26.54	152.3	3.65	2.76	1471.
170	4.70	33.53	169	26.57	149.3	3.80	3.01	1471.
180	4.56	33.55	179	26.60	146.6	3.95	3.28	1470.
190	4.37	33.56	189	26.63	143.8	4.09	3.55	1470.
200	4.30	33.57	199	26.64	142.1	4.24	3.83	1469.
210	4.21	33.58	209	26.66	140.6	4.38	4.13	1469.
220	4.20	33.59	218	26.67	140.0	4.52	4.44	1469.
230	4.13	33.60	228	26.69	138.5	4.66	4.76	1469.
240	4.09	33.61	238	26.70	137.3	4.79	5.08	1469.
250	4.05	33.62	248	26.71	136.4	4.93	5.43	1469.
260	4.01	33.63	258	26.72	135.2	5.07	5.78	1469.
270	3.96	33.64	268	26.73	134.2	5.20	6.14	1469.
280	3.92	33.64	278	26.74	133.4	5.34	6.52	1469.
290	3.89	33.65	288	26.75	132.6	5.47	6.90	1469.
300	3.86	33.67	298	26.76	131.3	5.60	7.30	1469.



OFFSHORE OCEANOGRAPHY GROUP

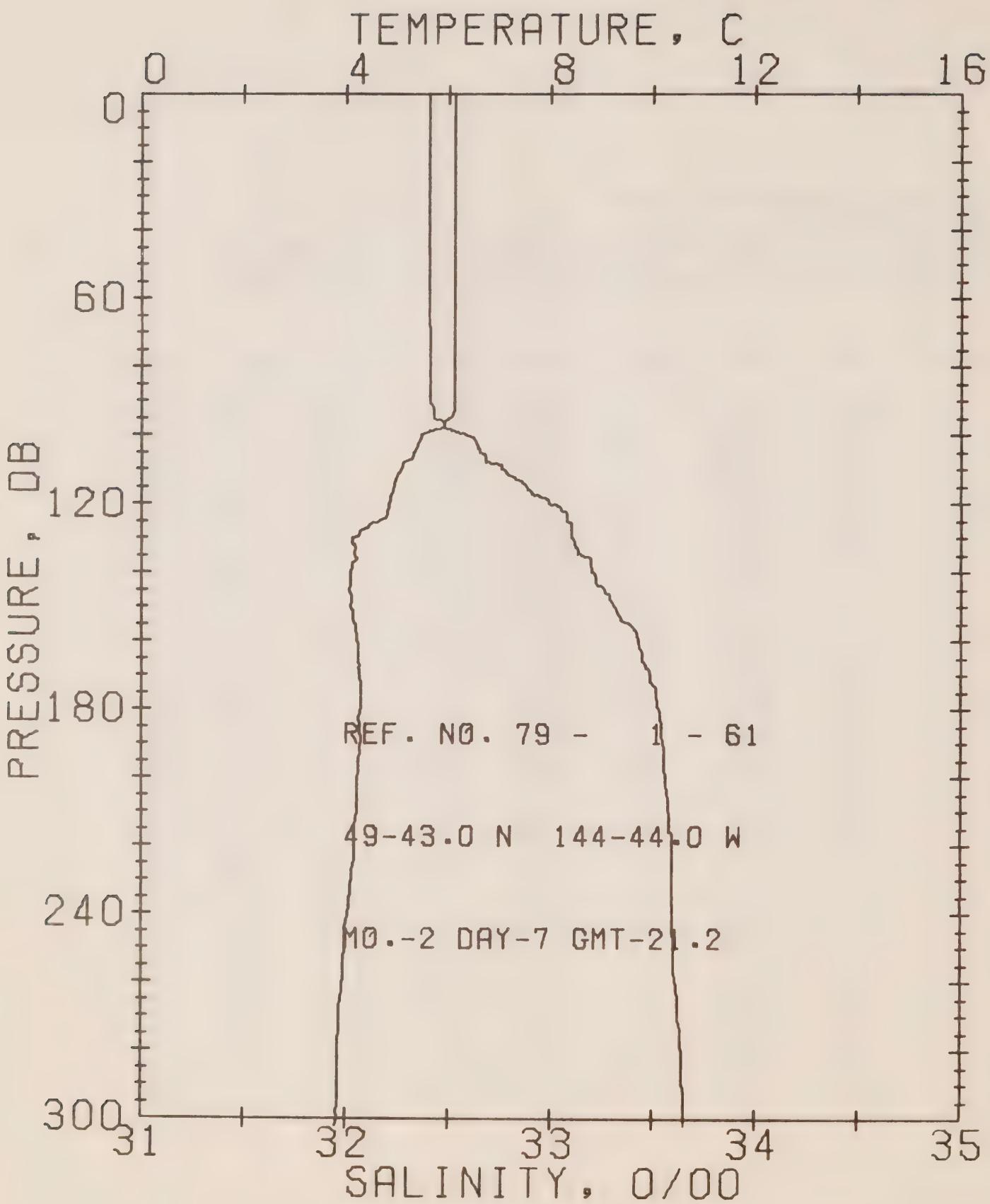
REFERENCE NO. 79- 1- 60 DATE 7/ 2/79

POSITION 49-52.0N, 144-52.0W GMT 19.5 STATION E3

RESULTS OF STP CAST 97 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.14	32.39	0	25.50	249.1	.00	.00	1472.
10	6.15	32.39	10	25.50	249.3	.25	.01	1472.
20	6.16	32.39	20	25.50	249.5	.50	.05	1473.
30	6.17	32.39	30	25.50	249.8	.75	.11	1473.
40	6.17	32.39	40	25.50	249.9	1.00	.20	1473.
50	6.17	32.39	50	25.50	250.0	1.25	.32	1473.
60	6.17	32.40	60	25.50	249.5	1.50	.46	1473.
70	6.17	32.40	70	25.50	249.5	1.75	.62	1473.
80	6.17	32.40	80	25.50	249.6	2.00	.81	1474.
90	6.17	32.40	89	25.50	249.7	2.25	1.03	1474.
100	6.17	32.41	99	25.51	249.1	2.50	1.27	1474.
110	6.16	32.42	109	25.52	248.2	2.74	1.54	1474.
120	5.32	32.65	119	25.80	221.5	2.98	1.82	1471.
130	4.67	32.95	129	26.11	192.1	3.19	2.08	1469.
140	4.64	33.12	139	26.25	179.1	3.38	2.34	1469.
150	4.66	33.31	149	26.40	165.2	3.55	2.59	1470.
160	4.55	33.45	159	26.52	153.9	3.71	2.84	1470.
170	4.52	33.49	169	26.55	150.6	3.86	3.10	1470.
180	4.41	33.51	179	26.58	147.7	4.01	3.36	1470.
190	4.39	33.53	189	26.60	146.2	4.16	3.64	1470.
200	4.34	33.55	199	26.62	144.2	4.30	3.93	1470.
210	4.29	33.56	209	26.64	142.9	4.44	4.23	1470.
220	4.23	33.57	218	26.65	141.5	4.59	4.54	1470.
230	4.18	33.58	228	26.66	140.6	4.73	4.86	1469.
240	4.13	33.59	238	26.67	139.7	4.87	5.20	1469.
250	4.08	33.59	248	26.68	138.9	5.01	5.55	1469.
260	4.04	33.60	258	26.69	137.9	5.14	5.91	1469.
270	3.95	33.61	268	26.71	136.3	5.28	6.28	1469.
280	3.92	33.61	278	26.72	135.7	5.42	6.66	1469.
290	3.89	33.63	288	26.73	134.5	5.55	7.05	1469.
300	3.86	33.64	298	26.74	133.7	5.69	7.46	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 61

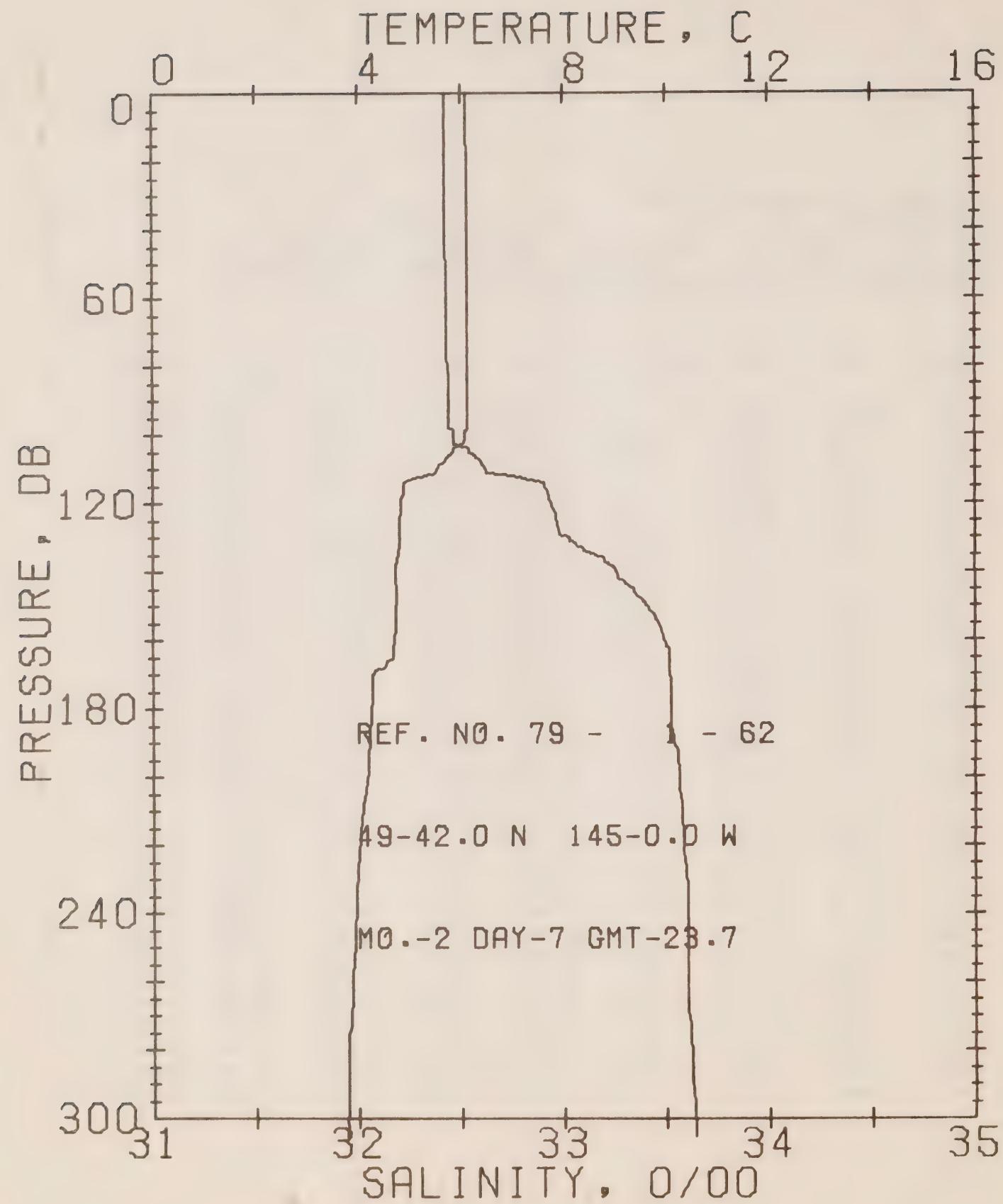
DATE 7/ 2/79

POSITION 49-43.0N, 144-44.0W GMT 21.2 STATION E4

RESULTS OF STD CAST 138 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.10	32.40	0	25.51	247.9	.00	.00	1472.
10	6.10	32.40	10	25.51	248.0	.25	.01	1472.
20	6.10	32.40	20	25.51	248.1	.50	.05	1472.
30	6.10	32.40	30	25.51	248.2	.74	.11	1473.
40	6.10	32.40	40	25.51	248.3	.99	.20	1473.
50	6.10	32.40	50	25.51	248.4	1.24	.32	1473.
60	6.11	32.40	60	25.51	248.6	1.49	.46	1473.
70	6.11	32.41	70	25.52	248.2	1.74	.62	1473.
80	6.10	32.41	80	25.52	248.1	1.99	.81	1473.
90	6.10	32.41	89	25.52	248.1	2.23	1.02	1474.
100	5.46	32.50	99	25.73	228.1	2.48	1.26	1471.
110	5.08	32.76	109	25.92	210.5	2.70	1.50	1470.
120	4.84	32.99	119	26.13	190.8	2.90	1.73	1470.
130	4.12	33.10	129	26.29	175.2	3.08	1.96	1467.
140	4.08	33.20	139	26.37	167.4	3.25	2.20	1467.
150	4.09	33.31	149	26.46	159.3	3.41	2.44	1467.
160	4.22	33.43	159	26.54	151.7	3.57	2.68	1468.
170	4.26	33.48	169	26.58	148.0	3.72	2.94	1469.
180	4.29	33.53	179	26.61	145.4	3.87	3.20	1469.
190	4.28	33.55	189	26.62	143.9	4.01	3.47	1469.
200	4.22	33.56	199	26.64	142.3	4.15	3.76	1469.
210	4.21	33.57	209	26.65	141.2	4.30	4.05	1469.
220	4.16	33.59	218	26.67	139.6	4.44	4.36	1469.
230	4.10	33.59	228	26.68	139.1	4.58	4.68	1469.
240	4.02	33.59	238	26.69	138.3	4.71	5.01	1469.
250	3.97	33.60	248	26.70	137.1	4.85	5.35	1469.
260	3.93	33.61	258	26.71	136.3	4.99	5.71	1469.
270	3.87	33.62	268	26.73	134.7	5.12	6.08	1469.
280	3.84	33.64	278	26.74	133.4	5.26	6.45	1469.
290	3.84	33.64	288	26.74	133.1	5.39	6.84	1469.
300	3.83	33.65	298	26.75	132.3	5.52	7.24	1469.



OFFSHORE OCEANOGRAPHY GROUP

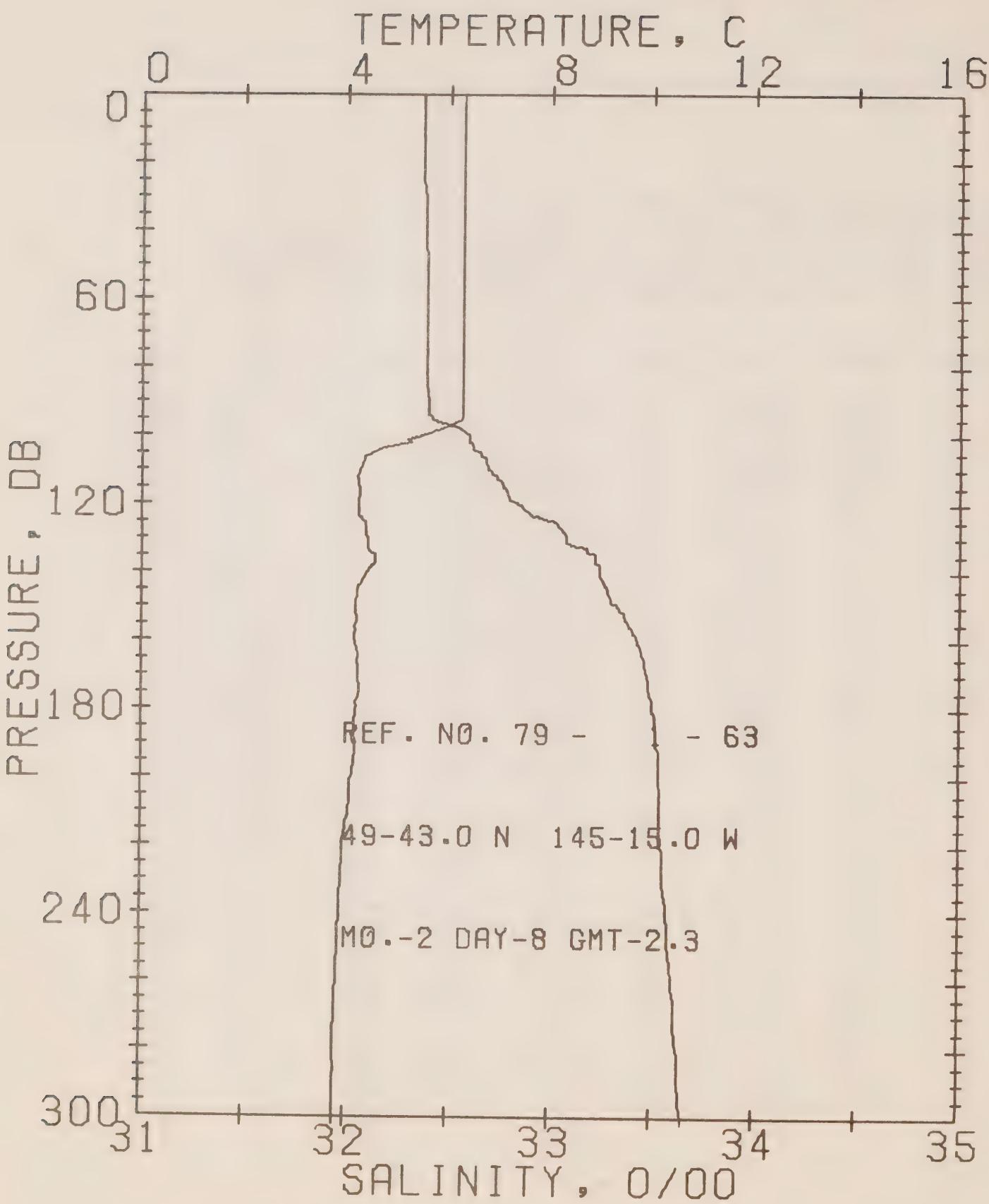
REFERENCE NO. 79- 1- 62

DATE 7/ 2/79

POSITION 49-42.0N, 145- .0W GMT 23.7 STATION C1

RESULTS OF STP CAST 117 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.12	32.42	0	25.53	246.6	.00	.00	1472.
10	6.12	32.42	10	25.53	246.7	.25	.01	1472.
20	6.13	32.42	20	25.52	247.0	.49	.05	1473.
30	6.13	32.42	30	25.52	247.1	.74	.11	1473.
40	6.14	32.42	40	25.52	247.3	.99	.20	1473.
50	6.14	32.43	50	25.52	247.0	1.23	.31	1473.
60	6.14	32.43	60	25.53	246.8	1.48	.45	1473.
70	6.14	32.43	70	25.53	246.9	1.73	.62	1473.
80	6.14	32.43	80	25.53	246.7	1.98	.81	1474.
90	6.14	32.44	89	25.54	246.4	2.22	1.02	1474.
100	6.07	32.46	99	25.56	244.1	2.47	1.26	1474.
110	5.53	32.61	109	25.75	226.7	2.70	1.51	1472.
120	4.83	32.93	119	26.08	194.8	2.91	1.75	1470.
130	4.81	33.02	129	26.15	188.3	3.10	1.99	1470.
140	4.72	33.25	139	26.34	170.2	3.28	2.24	1470.
150	4.73	33.40	149	26.46	159.2	3.44	2.48	1470.
160	4.70	33.49	159	26.54	152.2	3.60	2.73	1470.
170	4.28	33.51	169	26.66	146.4	3.75	2.98	1469.
180	4.23	33.52	179	26.61	145.2	3.89	3.24	1469.
190	4.21	33.53	189	26.62	144.3	4.04	3.51	1469.
200	4.17	33.56	199	26.65	141.7	4.18	3.80	1469.
210	4.06	33.57	209	26.67	140.0	4.32	4.09	1469.
220	4.01	33.58	218	26.68	138.8	4.46	4.40	1469.
230	3.97	33.59	228	26.70	137.4	4.60	4.71	1469.
240	3.94	33.60	238	26.70	136.8	4.74	5.04	1469.
250	3.91	33.60	248	26.71	136.5	4.87	5.38	1469.
260	3.88	33.60	258	26.71	136.3	5.01	5.74	1469.
270	3.83	33.60	268	26.72	135.7	5.15	6.10	1469.
280	3.79	33.62	278	26.73	134.3	5.28	6.48	1469.
290	3.78	33.62	288	26.74	133.9	5.41	6.87	1469.
300	3.76	33.63	298	26.74	133.1	5.55	7.27	1469.



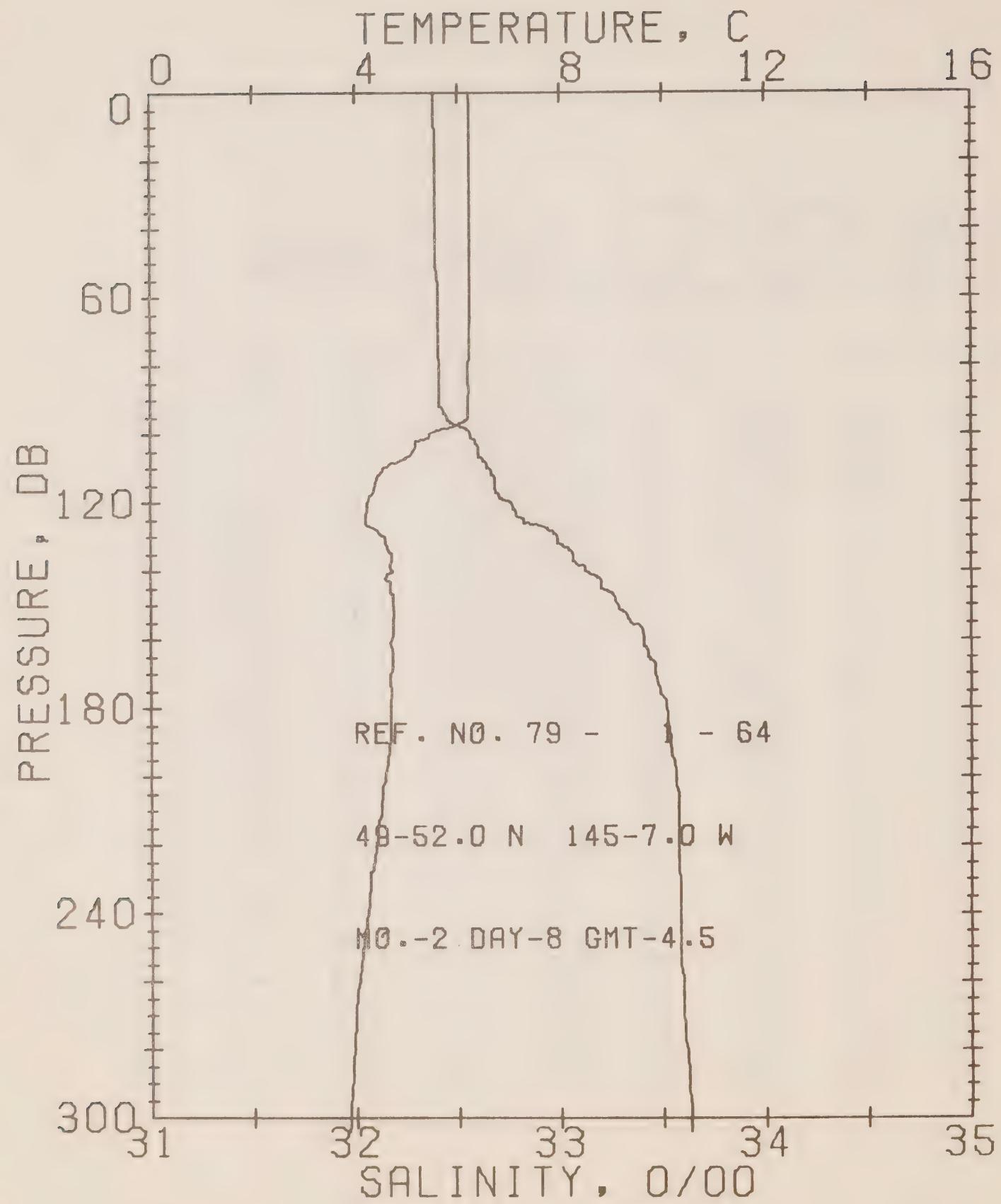
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 63 DATE 8/ 2/79

POSITION 49-43.0N, 145-15.0W GMT 2.3 STATION W4

RESULTS OF STP CAST 142 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.26	32.37	0	25.47	252.0	.00	.00	1473.
10	6.27	32.37	10	25.47	252.2	.25	.01	1473.
20	6.26	32.37	20	25.47	252.2	.50	.05	1473.
30	6.27	32.38	30	25.47	251.8	.76	.12	1473.
40	6.27	32.38	40	25.48	251.8	1.01	.21	1473.
50	6.28	32.39	50	25.48	251.3	1.26	.32	1474.
60	6.28	32.39	60	25.48	251.4	1.51	.46	1474.
70	6.28	32.39	70	25.48	251.5	1.76	.63	1474.
80	6.28	32.39	80	25.48	251.6	2.01	.82	1474.
90	6.27	32.40	89	25.49	250.9	2.27	1.04	1474.
100	5.46	32.60	99	25.75	226.6	2.51	1.28	1471.
110	4.28	32.69	109	25.95	207.4	2.73	1.51	1467.
120	4.25	32.84	119	26.07	195.9	2.93	1.74	1467.
130	4.43	33.08	129	26.24	179.8	3.11	1.98	1468.
140	4.39	33.24	139	26.37	167.5	3.29	2.22	1468.
150	4.18	33.33	149	26.46	158.7	3.45	2.46	1468.
160	4.18	33.42	159	26.54	151.6	3.60	2.70	1468.
170	4.23	33.47	169	26.57	148.6	3.75	2.95	1469.
180	4.19	33.50	179	26.60	146.3	3.90	3.22	1469.
190	4.16	33.52	189	26.62	144.6	4.05	3.49	1469.
200	4.11	33.53	199	26.63	143.4	4.19	3.78	1469.
210	4.06	33.54	209	26.64	142.2	4.33	4.08	1469.
220	3.94	33.54	218	26.66	141.1	4.48	4.39	1468.
230	3.91	33.55	228	26.67	140.1	4.62	4.71	1468.
240	3.89	33.57	238	26.68	138.5	4.75	5.04	1468.
250	3.86	33.58	248	26.70	137.4	4.89	5.39	1468.
260	3.83	33.60	258	26.71	135.8	5.03	5.74	1468.
270	3.81	33.61	268	26.72	134.9	5.16	6.11	1469.
280	3.80	33.62	278	26.74	133.8	5.30	6.48	1469.
290	3.80	33.63	288	26.74	133.3	5.43	6.87	1469.
300	3.79	33.65	298	26.76	132.1	5.56	7.27	1469.



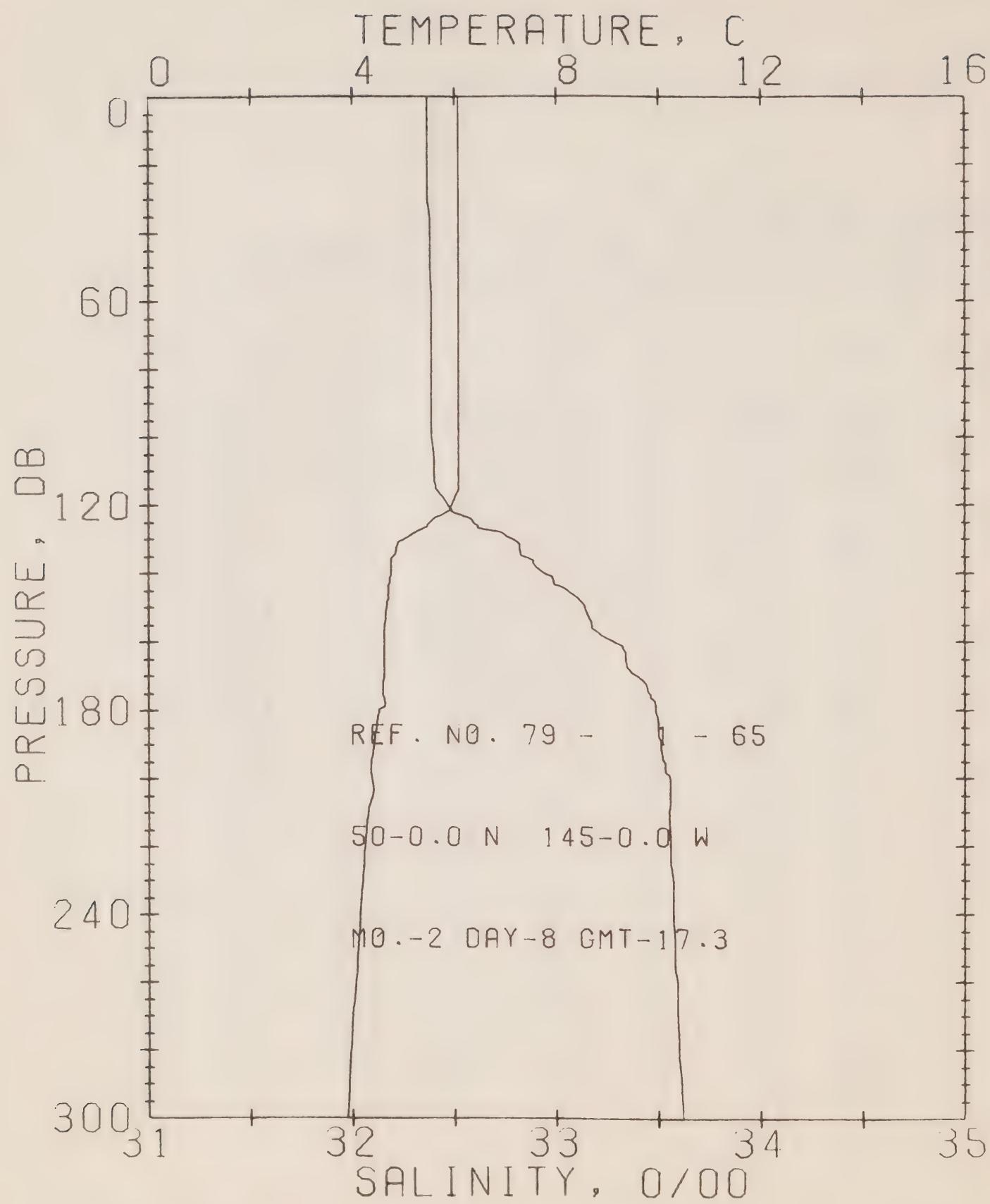
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 64 DATE 8/ 2/79

POSITION 49-52.0N, 145- 7.0W GMT 4.5 STATION W3

RESULTS OF STP CAST 145 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.22	32.38	0	25.47	250.8	.00	.00	1473.
10	6.24	32.38	10	25.48	250.9	.25	.01	1473.
20	6.24	32.39	20	25.49	250.5	.50	.05	1473.
30	6.24	32.39	30	25.49	250.6	.75	.11	1473.
40	6.24	32.39	40	25.49	250.7	1.00	.20	1473.
50	6.24	32.39	50	25.49	250.8	1.25	.32	1473.
60	6.24	32.40	60	25.50	250.2	1.50	.46	1474.
70	6.22	32.40	70	25.50	250.0	1.75	.63	1474.
80	6.20	32.41	80	25.51	249.3	2.00	.82	1474.
90	6.20	32.41	89	25.51	249.3	2.25	1.03	1474.
100	5.45	32.55	99	25.71	230.2	2.50	1.27	1471.
110	4.53	32.64	109	25.88	213.7	2.72	1.51	1468.
120	4.22	32.75	119	26.00	202.4	2.93	1.75	1467.
130	4.56	32.98	129	26.15	188.7	3.13	2.00	1469.
140	4.73	33.12	139	26.24	180.0	3.31	2.26	1470.
150	4.74	33.26	149	26.37	168.2	3.48	2.51	1470.
160	4.70	33.41	159	26.47	158.2	3.65	2.77	1470.
170	4.68	33.46	169	26.51	154.3	3.80	3.03	1470.
180	4.68	33.51	179	26.56	150.4	3.95	3.30	1471.
190	4.65	33.53	189	26.57	149.0	4.10	3.59	1471.
200	4.56	33.56	199	26.61	145.8	4.25	3.88	1471.
210	4.47	33.57	209	26.62	144.3	4.40	4.18	1470.
220	4.38	33.57	218	26.63	143.4	4.54	4.50	1470.
230	4.27	33.58	228	26.65	141.5	4.68	4.82	1470.
240	4.22	33.58	238	26.66	141.1	4.82	5.16	1470.
250	4.12	33.58	248	26.67	140.1	4.96	5.51	1470.
260	4.03	33.59	258	26.69	138.6	5.10	5.88	1469.
270	3.98	33.59	268	26.69	137.9	5.24	6.25	1469.
280	3.95	33.61	278	26.71	136.6	5.38	6.63	1469.
290	3.91	33.62	288	26.72	135.3	5.52	7.03	1469.
300	3.87	33.63	298	26.73	134.2	5.65	7.43	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 65 DATE 8/ 2/79

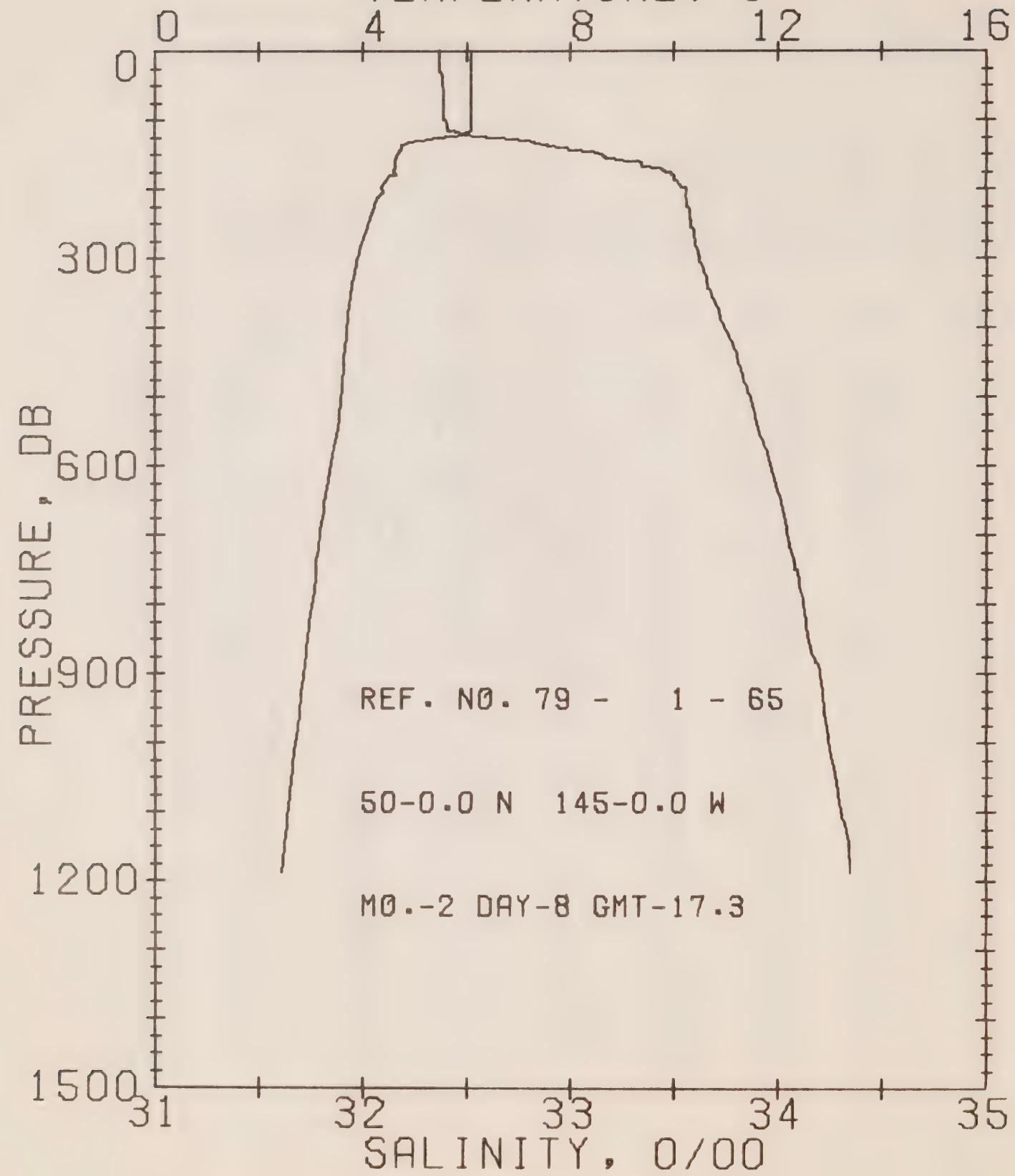
POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 123 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.07	32.37	0	25.49	249.8	.00	.00	1472.
10	6.07	32.37	10	25.49	249.9	.25	.01	1472.
20	6.08	32.37	20	25.49	250.1	.50	.05	1472.
30	6.07	32.37	30	25.49	250.1	.75	.11	1472.
40	6.08	32.36	40	25.50	249.6	1.00	.20	1473.
50	6.09	32.38	50	25.50	249.8	1.25	.32	1473.
60	6.08	32.39	60	25.51	249.0	1.50	.46	1473.
70	6.08	32.39	70	25.51	249.2	1.75	.62	1473.
80	6.09	32.39	80	25.51	249.3	2.00	.81	1473.
90	6.09	32.39	89	25.51	249.5	2.25	1.03	1473.
100	6.09	32.39	99	25.51	249.5	2.50	1.27	1474.
110	6.09	32.40	109	25.51	249.0	2.75	1.54	1474.
120	5.95	32.47	119	25.59	242.2	2.99	1.83	1473.
130	5.04	32.74	129	25.94	208.0	3.22	2.12	1470.
140	4.76	32.94	139	26.09	193.9	3.42	2.39	1470.
150	4.65	33.14	149	26.26	178.1	3.61	2.67	1470.
160	4.62	33.29	159	26.39	166.3	3.78	2.94	1470.
170	4.61	33.40	169	26.47	158.1	3.94	3.21	1470.
180	4.50	33.49	179	26.56	150.3	4.10	3.49	1470.
190	4.41	33.51	189	26.56	147.9	4.24	3.77	1470.
200	4.38	33.56	199	26.63	143.9	4.39	4.06	1470.
210	4.29	33.55	209	26.63	143.8	4.53	4.36	1470.
220	4.23	33.56	218	26.64	142.5	4.68	4.67	1469.
230	4.19	33.57	228	26.65	141.5	4.82	5.00	1469.
240	4.14	33.57	238	26.66	141.0	4.96	5.34	1469.
250	4.10	33.58	248	26.67	139.9	5.10	5.69	1469.
260	4.06	33.59	258	26.68	138.9	5.24	6.05	1469.
270	4.00	33.59	268	26.69	138.2	5.38	6.43	1469.
280	3.96	33.60	278	26.70	137.2	5.52	6.81	1469.
290	3.93	33.61	288	26.71	136.3	5.65	7.21	1469.
300	3.90	33.62	298	26.72	135.3	5.79	7.62	1469.

TEMPERATURE, C



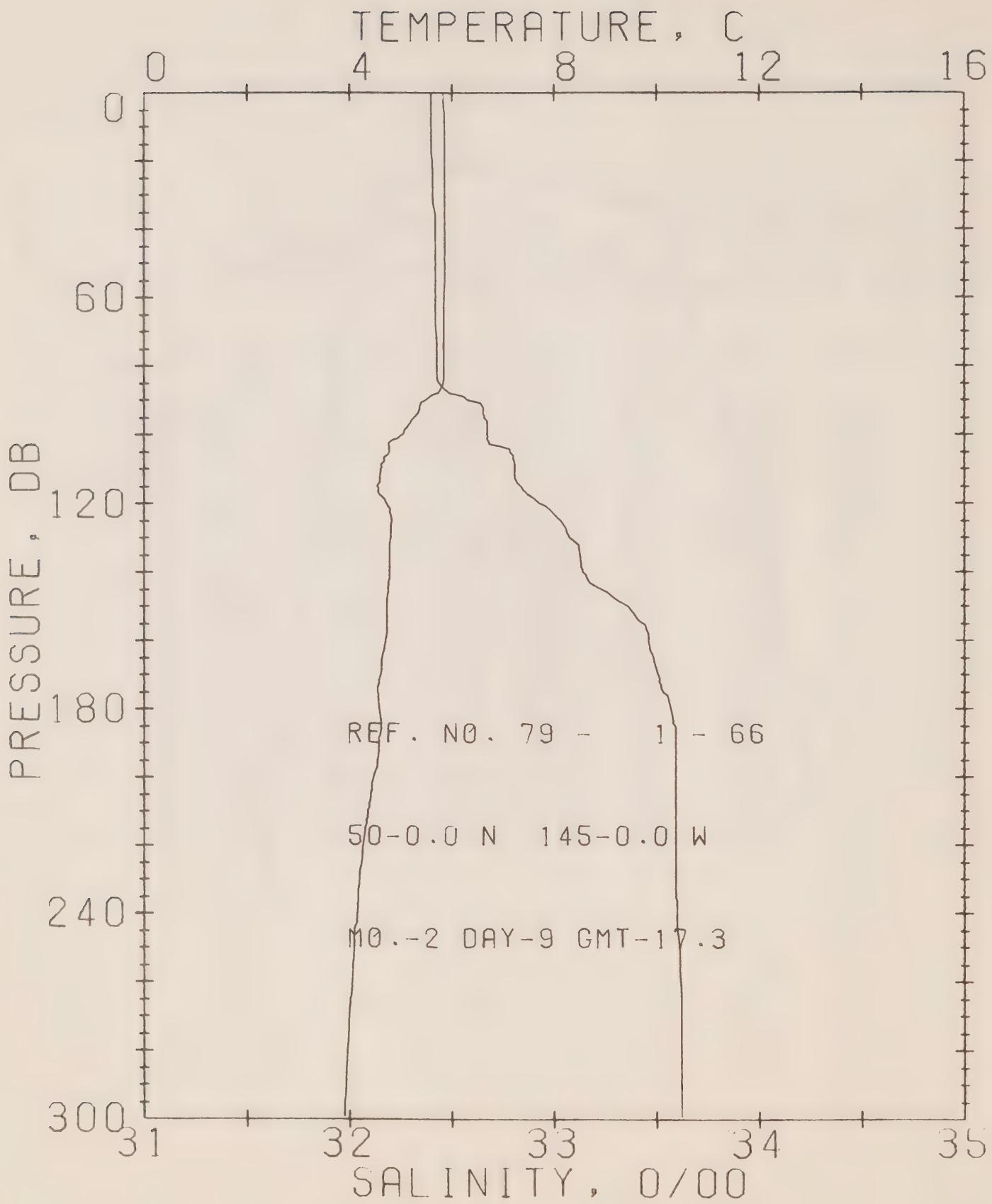
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 65 DATE 8/ 2/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STD CAST 264 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.07	32.37	0	25.49	249.8	.00	.00	1472.
10	6.07	32.37	10	25.49	249.9	.25	.01	1472.
20	6.08	32.37	20	25.49	250.1	.50	.05	1472.
30	6.07	32.37	30	25.49	250.1	.75	.11	1472.
50	6.09	32.38	50	25.50	249.8	1.25	.32	1473.
75	6.08	32.39	75	25.51	249.2	1.87	.72	1473.
100	6.09	32.39	99	25.51	249.5	2.50	1.27	1474.
125	5.52	32.59	124	25.73	228.3	3.11	1.97	1472.
150	4.65	33.14	149	26.26	178.1	3.61	2.67	1470.
175	4.58	33.46	174	26.53	153.3	4.02	3.35	1470.
200	4.38	33.56	199	26.63	143.9	4.39	4.06	1470.
225	4.21	33.56	223	26.64	142.4	4.75	4.84	1469.
250	4.10	33.58	248	26.67	139.9	5.10	5.69	1469.
300	3.90	33.62	298	26.72	135.3	5.79	7.62	1469.
400	3.69	33.74	397	26.84	124.9	7.09	12.26	1470.
500	3.59	33.86	496	26.95	115.3	8.29	17.74	1472.
600	3.39	33.96	595	27.05	106.5	9.40	23.96	1473.
800	3.02	34.12	793	27.20	92.3	11.38	38.05	1475.
1000	2.70	34.24	990	27.33	81.0	13.11	53.86	1477.
1200	2.44	34.35	1188	27.44	71.3	14.63	70.84	1479.



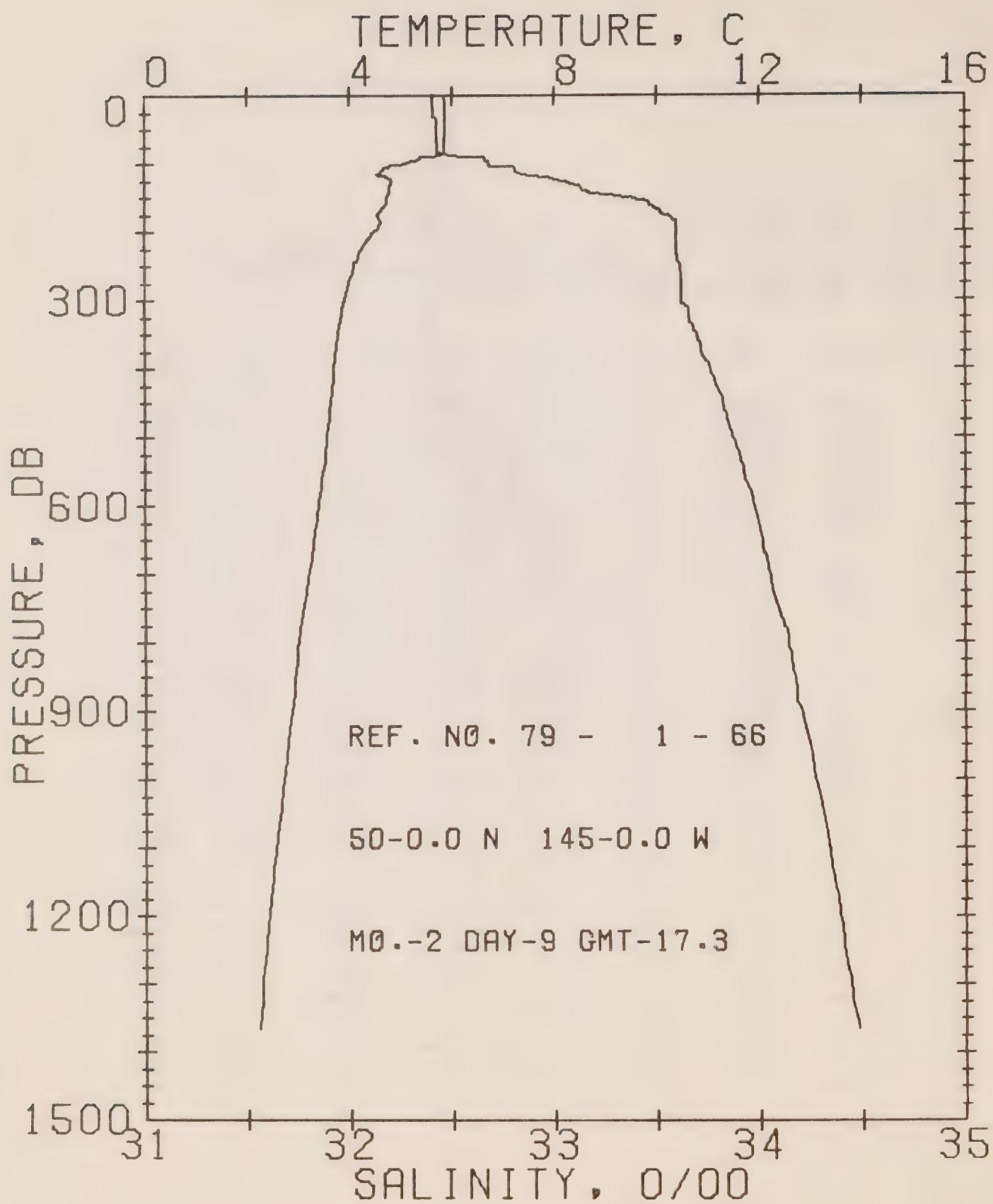
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 66 DATE 9/ 2/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 140 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED. PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.84	32.40	0	25.54	244.9	.00	.00	1471.
10	5.86	32.40	10	25.54	245.2	.25	.01	1471.
20	5.87	32.40	20	25.55	245.0	.49	.05	1471.
30	5.87	32.41	30	25.55	244.8	.74	.11	1472.
40	5.87	32.42	40	25.56	244.1	.98	.20	1472.
50	5.86	32.42	50	25.56	244.1	1.22	.31	1472.
60	5.85	32.42	60	25.56	244.2	1.47	.45	1472.
70	5.85	32.42	70	25.56	243.9	1.71	.61	1472.
80	5.83	32.43	79	25.57	243.3	1.96	.80	1472.
90	5.49	32.57	39	25.72	229.1	2.20	1.00	1471.
100	5.05	32.67	99	25.85	216.8	2.42	1.22	1470.
110	4.60	32.81	109	26.01	201.7	2.62	1.44	1468.
120	4.73	32.93	119	26.09	194.1	2.82	1.67	1469.
130	4.79	33.07	129	26.19	184.3	3.01	1.91	1470.
140	4.78	33.14	139	26.25	179.1	3.19	2.16	1470.
150	4.72	33.36	149	26.43	162.1	3.36	2.41	1470.
160	4.70	33.46	159	26.51	154.5	3.52	2.66	1470.
170	4.60	33.51	169	26.56	150.1	3.67	2.92	1470.
180	4.58	33.57	179	26.61	145.3	3.82	3.18	1470.
190	4.56	33.59	189	26.63	143.5	3.96	3.45	1470.
200	4.47	33.59	199	26.64	142.7	4.11	3.74	1470.
210	4.35	33.59	209	26.65	141.5	4.25	4.03	1470.
220	4.26	33.59	218	26.66	140.6	4.39	4.34	1470.
230	4.18	33.59	228	26.67	139.9	4.53	4.67	1469.
240	4.14	33.60	238	26.68	138.7	4.67	5.00	1469.
250	4.08	33.61	248	26.70	137.6	4.81	5.34	1469.
260	4.04	33.61	258	26.70	136.9	4.95	5.70	1469.
270	3.98	33.62	268	26.71	135.9	5.08	6.07	1469.
280	3.95	33.62	278	26.71	135.6	5.22	6.45	1469.
290	3.91	33.62	288	26.72	135.4	5.35	6.84	1469.
300	3.88	33.62	298	26.72	135.1	5.49	7.25	1469.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79-1-66 DATE 9/2/79

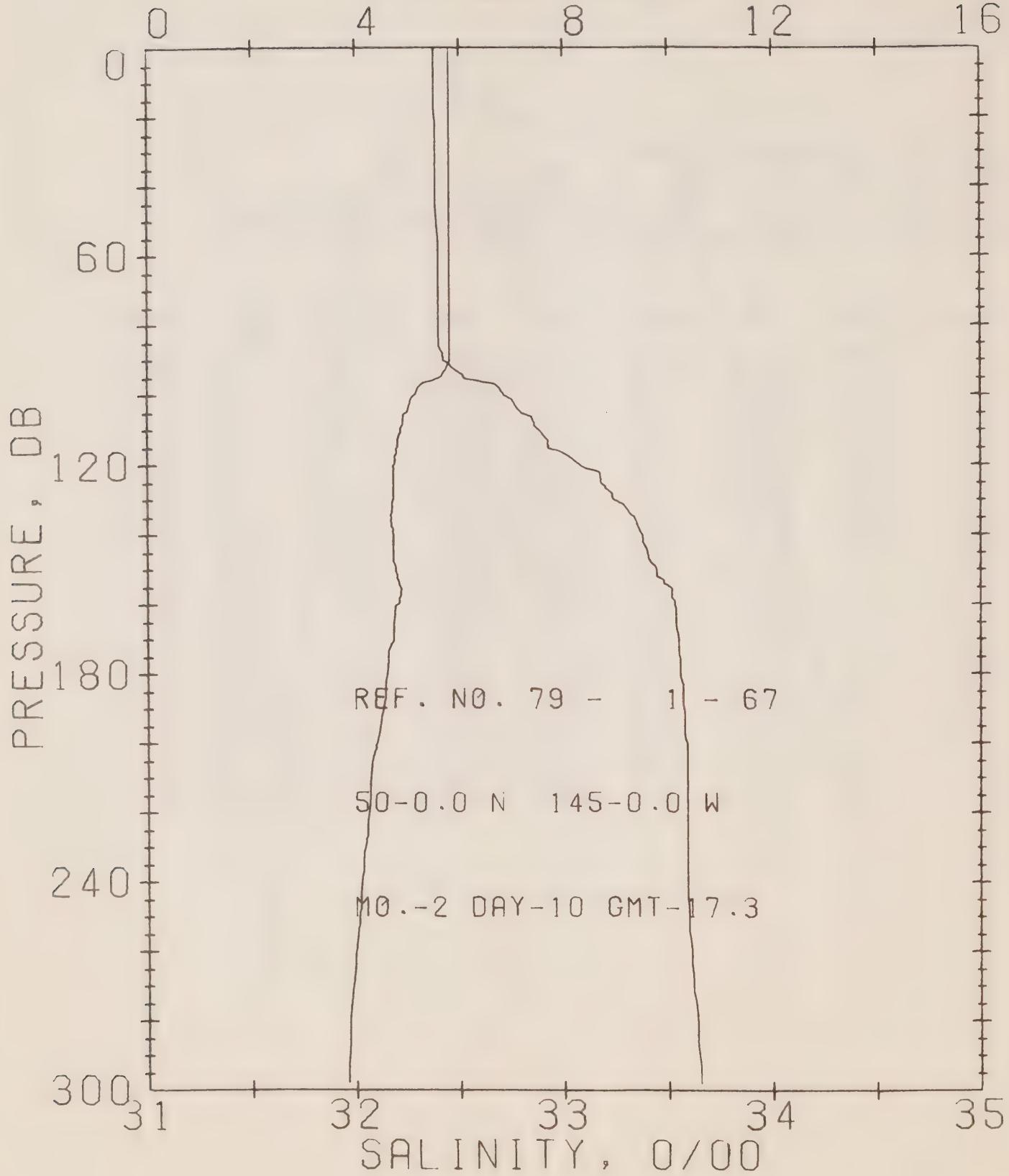
POSITION 50° .0N, 145° .0W GMT 17.3 STATION P

RESULTS OF STP CAST 243 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
6	5.84	32.40	0	25.54	244.9	.00	.00	1471.
10	5.86	32.40	10	25.54	245.2	.25	.01	1471.
20	5.87	32.40	20	25.55	245.0	.49	.05	1471.
30	5.87	32.41	30	25.55	244.8	.74	.11	1472.
50	5.86	32.42	50	25.56	244.1	1.22	.31	1472.
75	5.83	32.43	75	25.57	243.3	1.83	.70	1472.
100	5.05	32.67	99	25.85	216.8	2.42	1.22	1470.
125	4.82	33.03	124	26.16	137.6	2.92	1.79	1470.
150	4.72	33.36	149	26.43	162.1	3.36	2.41	1470.
175	4.54	33.53	174	26.58	147.6	3.75	3.05	1470.
200	4.47	33.59	199	26.64	142.7	4.11	3.74	1470.
225	4.22	33.59	223	26.67	140.2	4.46	4.50	1470.
250	4.00	33.61	248	26.76	137.6	4.81	5.34	1469.
300	3.88	33.62	298	26.72	135.1	5.49	7.25	1469.
400	3.68	33.76	397	26.85	123.7	6.78	11.86	1470.
500	3.56	33.87	496	26.96	114.5	7.97	17.30	1472.
600	3.38	33.97	595	27.05	105.8	9.07	23.46	1473.
800	2.98	34.14	793	27.22	90.5	11.04	37.50	1474.
1000	2.69	34.27	990	27.35	78.9	12.75	53.06	1477.
1200	2.40	34.39	1198	27.47	67.8	14.20	69.37	1479.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 67 DATE 10/ 2/79

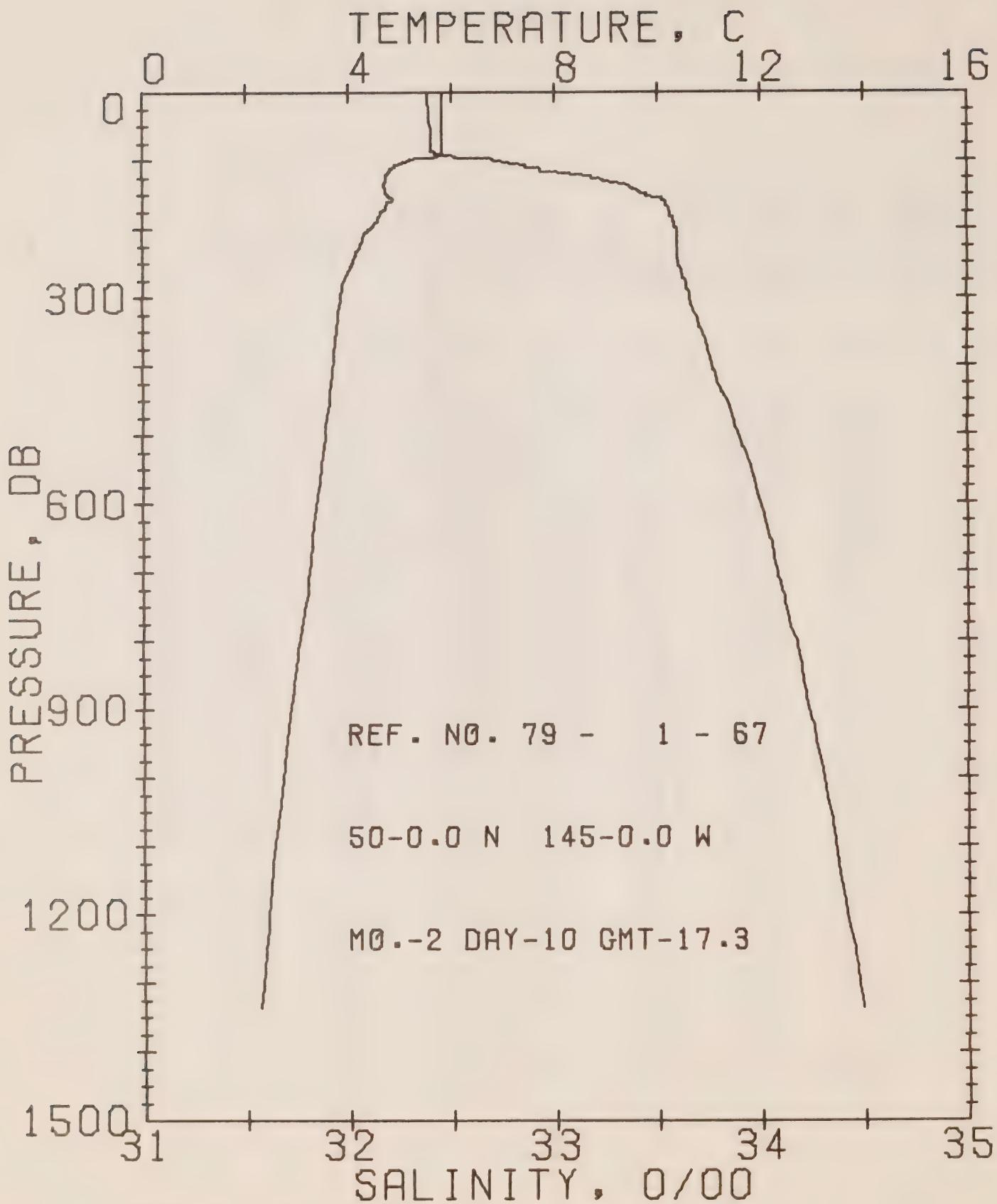
POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 130 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.80	32.38	0	25.53	245.9	.00	.00	1471.
10	5.80	32.38	10	25.53	246.0	.25	.01	1471.
20	5.81	32.39	20	25.54	245.7	.49	.05	1471.
30	5.81	32.39	30	25.54	245.6	.74	.11	1471.
40	5.81	32.39	40	25.54	245.6	.98	.20	1471.
50	5.80	32.39	50	25.55	245.3	1.23	.31	1472.
60	5.80	32.40	60	25.55	245.0	1.47	.45	1472.
70	5.80	32.40	70	25.55	245.1	1.72	.61	1472.
80	5.80	32.40	80	25.55	245.2	1.96	.80	1472.
90	5.81	32.42	90	25.56	244.0	2.21	1.01	1472.
100	5.14	32.71	99	25.87	214.8	2.44	1.23	1470.
110	4.86	32.89	109	26.04	198.4	2.64	1.45	1469.
120	4.74	33.08	119	26.21	133.0	2.84	1.68	1469.
130	4.71	33.24	129	26.34	170.8	3.01	1.90	1470.
140	4.71	33.38	139	26.45	160.4	3.18	2.13	1470.
150	4.77	33.45	149	26.50	155.9	3.33	2.36	1470.
160	4.84	33.53	159	26.55	150.7	3.49	2.60	1471.
170	4.73	33.55	169	26.58	148.1	3.64	2.85	1471.
180	4.59	33.56	179	26.60	146.0	3.78	3.12	1470.
190	4.53	33.57	189	26.62	144.2	3.93	3.39	1470.
200	4.41	33.59	199	26.65	142.0	4.07	3.67	1470.
210	4.29	33.59	209	26.66	140.8	4.21	3.97	1470.
220	4.23	33.54	218	26.67	140.3	4.35	4.28	1470.
230	4.17	33.59	228	26.67	139.7	4.49	4.60	1469.
240	4.10	33.59	238	26.68	139.2	4.63	4.93	1469.
250	4.04	33.60	248	26.69	137.8	4.77	5.28	1469.
260	3.99	33.61	258	26.71	136.6	4.91	5.64	1469.
270	3.94	33.62	268	26.72	135.5	5.04	6.00	1469.
280	3.88	33.64	278	26.74	133.4	5.18	6.38	1469.
290	3.86	33.64	288	26.75	132.9	5.31	6.77	1469.
300	3.83	33.65	298	26.75	132.4	5.44	7.17	1469.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

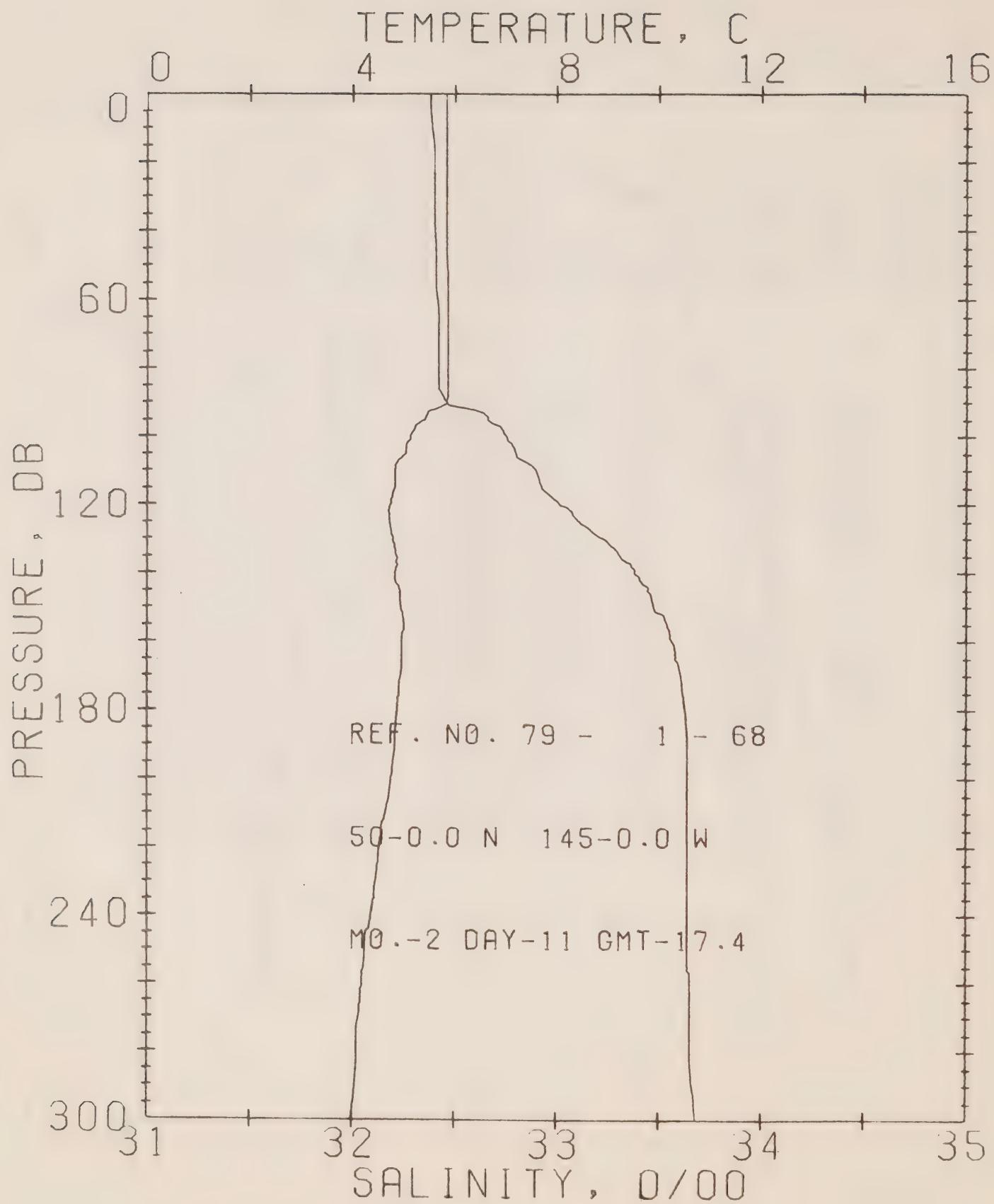
REFERENCE NO. 79- 1- 67 DATE 10/ 2/79

POSITION 50- .0N, 145- .0W GMT 17.3 STATION P

RESULTS OF STP CAST 215 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.80	32.38	0	25.53	245.9	.00	.00	1471.
10	5.80	32.38	10	25.53	246.0	.25	.01	1471.
20	5.81	32.39	20	25.54	245.7	.49	.05	1471.
30	5.81	32.39	30	25.54	245.6	.74	.11	1471.
50	5.80	32.39	50	25.55	245.3	1.23	.31	1472.
75	5.80	32.40	75	25.55	245.2	1.84	.70	1472.
100	5.14	32.71	99	25.87	214.8	2.44	1.23	1470.
125	4.71	33.16	124	26.29	175.2	2.93	1.79	1469.
150	4.77	33.45	149	26.50	155.9	3.33	2.36	1470.
175	4.61	33.56	174	26.60	146.1	3.71	2.98	1470.
200	4.41	33.59	199	26.65	142.0	4.07	3.67	1470.
225	4.21	33.59	223	26.67	140.1	4.42	4.44	1470.
250	4.04	33.60	248	26.69	137.8	4.77	5.28	1469.
300	3.83	33.65	298	26.75	132.4	5.44	7.17	1469.
400	3.69	33.76	397	26.86	123.2	6.72	11.71	1470.
500	3.54	33.89	496	26.97	112.8	7.90	17.11	1472.
600	3.37	33.99	595	27.07	104.0	8.98	23.17	1473.
800	3.01	34.16	793	27.24	89.0	10.92	36.94	1475.
1000	2.69	34.30	990	27.38	76.8	12.58	52.13	1477.
1200	2.41	34.41	1188	27.49	66.6	14.01	68.11	1479.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 68

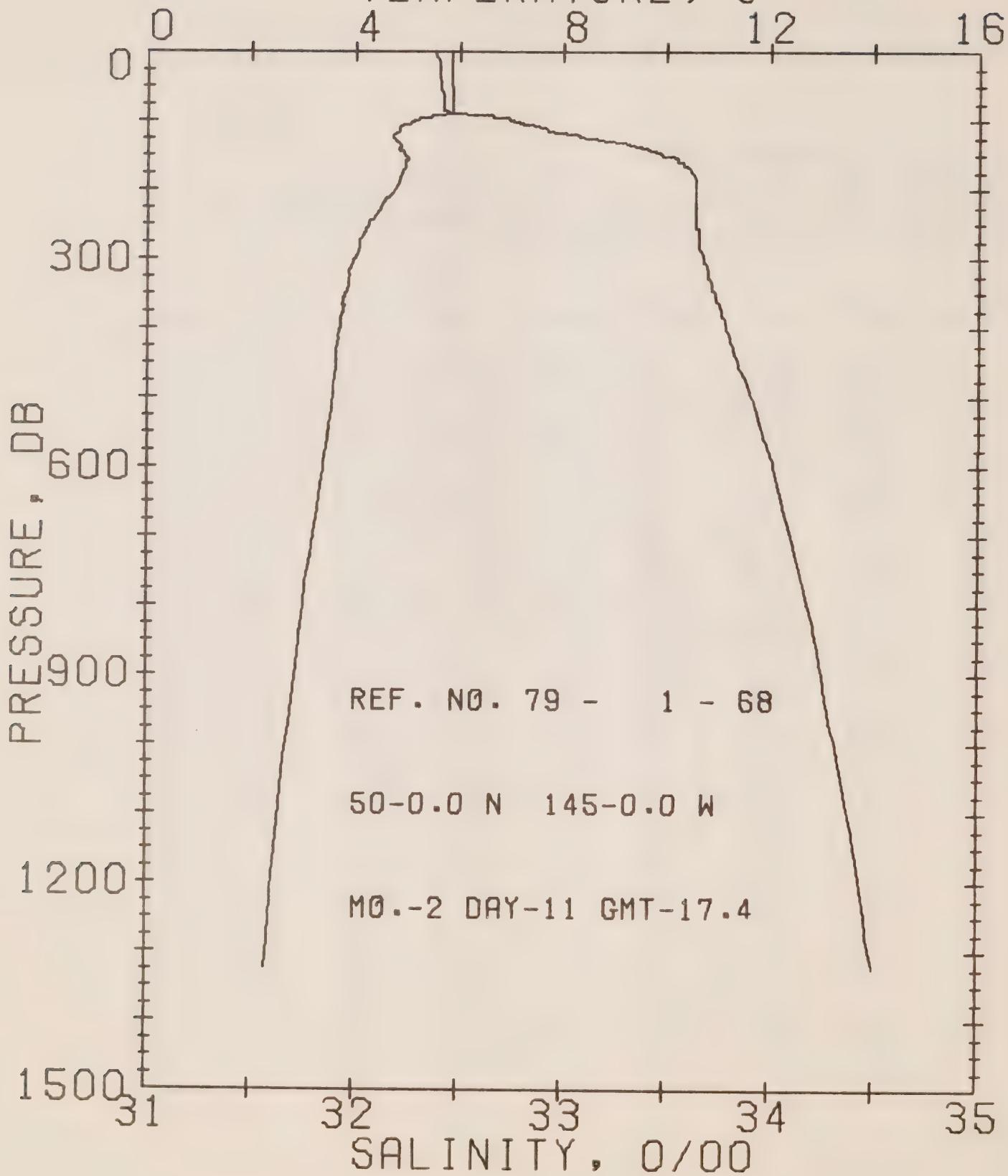
DATE 11/ 2/79

POSITION 50° .0N, 145° .0W GMT 17.4 STATION P

RESULTS OF STP CAST 131 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.83	32.38	0	25.53	246.2	.00	.00	1471.
10	5.84	32.39	10	25.54	245.6	.25	.01	1471.
20	5.84	32.40	20	25.54	245.1	.49	.05	1471.
30	5.84	32.40	30	25.54	245.2	.74	.11	1471.
40	5.84	32.40	40	25.55	245.1	.98	.20	1472.
50	5.86	32.41	50	25.55	244.8	1.23	.31	1472.
60	5.86	32.41	60	25.55	244.6	1.47	.45	1472.
70	5.86	32.42	70	25.56	244.3	1.72	.61	1472.
80	5.86	32.42	79	25.56	244.4	1.96	.80	1472.
90	5.84	32.46	89	25.59	241.3	2.20	1.01	1473.
100	5.13	32.75	99	25.90	211.7	2.43	1.22	1470.
110	4.84	32.90	109	26.05	197.4	2.63	1.44	1469.
120	4.74	33.01	119	26.15	188.2	2.83	1.67	1469.
130	4.79	33.23	129	26.32	172.4	3.01	1.90	1470.
140	4.84	33.38	139	26.43	161.8	3.17	2.13	1470.
150	4.95	33.48	149	26.50	155.9	3.33	2.36	1471.
160	4.95	33.56	159	26.56	149.7	3.48	2.60	1472.
170	4.94	33.61	169	26.66	146.3	3.63	2.85	1472.
180	4.87	33.62	179	26.62	144.1	3.78	3.11	1472.
190	4.83	33.64	169	26.64	142.7	3.92	3.38	1472.
200	4.75	33.64	199	26.65	141.9	4.06	3.66	1471.
210	4.64	33.64	209	26.66	140.8	4.20	3.96	1471.
220	4.53	33.64	218	26.67	139.7	4.34	4.27	1471.
230	4.46	33.64	228	26.68	139.0	4.48	4.59	1471.
240	4.36	33.64	238	26.69	138.1	4.62	4.92	1470.
250	4.23	33.64	248	26.70	136.8	4.76	5.26	1470.
260	4.19	33.65	258	26.72	135.7	4.89	5.62	1470.
270	4.12	33.65	268	26.72	135.1	5.03	5.98	1470.
280	4.07	33.65	278	26.73	134.7	5.16	6.36	1470.
290	4.04	33.66	288	26.74	133.5	5.30	6.75	1470.
300	4.00	33.66	298	26.76	131.8	5.43	7.15	1470.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

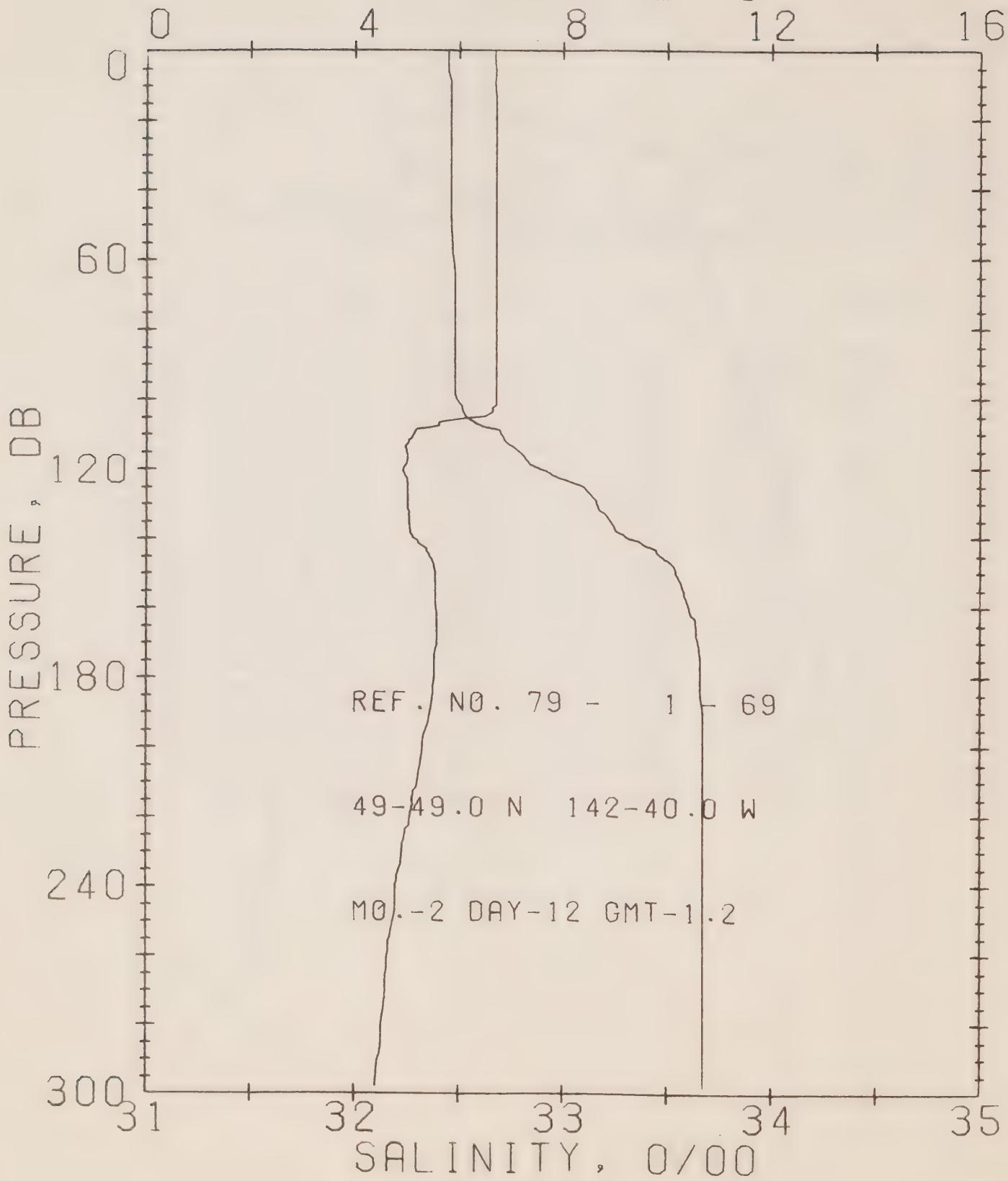
REFERENCE NO. 79- 1- 68 DATE 11/ 2/79

POSITION 50- .0N, 145- .0W GMT 17.4 STATION P

RESULTS OF STP CAST 218 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DLPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	5.83	32.38	0	25.53	246.2	.00	.00	1471.
10	5.84	32.39	10	25.54	245.6	.25	.01	1471.
20	5.84	32.40	20	25.54	245.1	.49	.05	1471.
30	5.84	32.40	30	25.54	245.2	.74	.11	1471.
50	5.86	32.41	50	25.55	244.8	1.23	.31	1472.
75	5.86	32.42	75	25.56	244.4	1.84	.70	1472.
100	5.13	32.75	99	25.90	211.7	2.43	1.22	1470.
125	4.73	33.11	124	26.23	180.7	2.92	1.79	1469.
150	4.95	33.48	149	26.50	155.9	3.33	2.36	1471.
175	4.91	33.61	174	26.61	145.3	3.70	2.98	1472.
200	4.75	33.64	199	26.65	141.9	4.06	3.66	1471.
225	4.50	33.64	223	26.68	139.4	4.41	4.43	1471.
250	4.23	33.64	248	26.70	136.8	4.76	5.26	1470.
300	4.00	33.68	298	26.76	131.8	5.43	7.15	1470.
400	3.70	33.79	397	26.88	121.3	6.70	11.65	1470.
500	3.56	33.91	496	26.99	111.7	7.86	16.99	1472.
600	3.38	34.01	595	27.08	102.9	8.93	22.99	1473.
800	3.00	34.18	793	27.26	87.5	10.84	36.53	1475.
1000	2.69	34.32	990	27.39	75.5	12.47	51.45	1477.
1200	2.41	34.44	1188	27.51	64.7	13.87	67.08	1479.

TEMPERATURE, C



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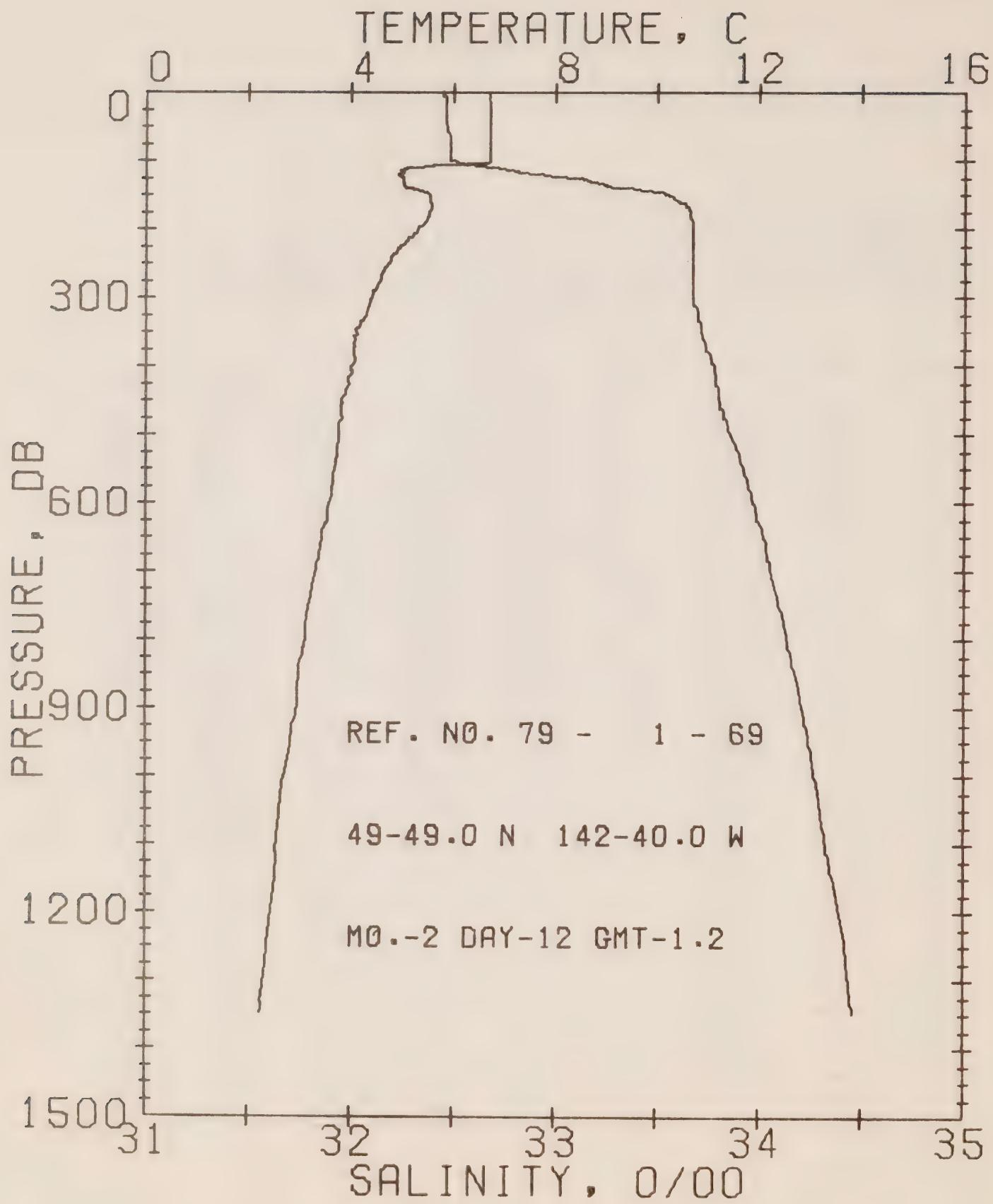
REFERENCE NO. 79-1-69 DATE 12/2/79

POSITION 49-49.0N 142-40.0W GMT 1.2 STATION 12

RESULTS OF STP CAST 100 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.69	32.45	0	25.48	251.2	.00	.00	1474.
10	6.70	32.46	10	25.48	250.7	.25	.01	1475.
20	6.71	32.46	20	25.48	251.0	.50	.05	1475.
30	6.72	32.46	30	25.48	251.2	.75	.12	1475.
40	6.72	32.46	40	25.48	251.4	1.00	.20	1475.
50	6.72	32.46	50	25.48	251.2	1.26	.32	1475.
60	6.72	32.47	60	25.49	250.6	1.51	.46	1476.
70	6.73	32.48	70	25.50	250.4	1.76	.63	1476.
80	6.73	32.48	80	25.50	250.5	2.01	.82	1476.
90	6.72	32.48	89	25.50	250.5	2.26	1.04	1476.
100	6.72	32.49	99	25.50	249.9	2.51	1.28	1476.
110	5.13	32.70	109	25.88	215.5	2.75	1.53	1470.
120	4.93	32.88	119	26.03	200.0	2.95	1.78	1470.
130	5.01	33.16	129	26.24	180.0	3.14	2.01	1471.
140	5.12	33.31	139	26.35	170.1	3.32	2.26	1472.
150	5.55	33.54	149	26.48	157.9	3.48	2.50	1474.
160	5.55	33.60	159	26.53	153.3	3.64	2.74	1474.
170	5.56	33.65	169	26.56	150.3	3.79	3.00	1474.
180	5.51	33.66	179	26.58	148.9	3.94	3.26	1474.
190	5.43	33.67	189	26.59	147.2	4.08	3.54	1474.
200	5.30	33.67	199	26.61	145.8	4.23	3.83	1474.
210	5.20	33.67	209	26.62	144.8	4.38	4.14	1473.
220	5.07	33.67	218	26.64	143.4	4.52	4.45	1473.
230	4.92	33.67	228	26.65	141.8	4.66	4.78	1473.
240	4.78	33.67	238	26.67	140.4	4.80	5.12	1472.
250	4.74	33.67	248	26.67	140.0	4.94	5.47	1472.
260	4.62	33.67	258	26.69	138.9	5.08	5.83	1472.
270	4.58	33.67	268	26.69	138.5	5.22	6.20	1472.
280	4.52	33.67	278	26.70	137.9	5.36	6.59	1472.
290	4.40	33.67	288	26.70	137.3	5.50	6.99	1472.
300	4.39	33.67	298	26.71	136.7	5.64	7.40	1472.



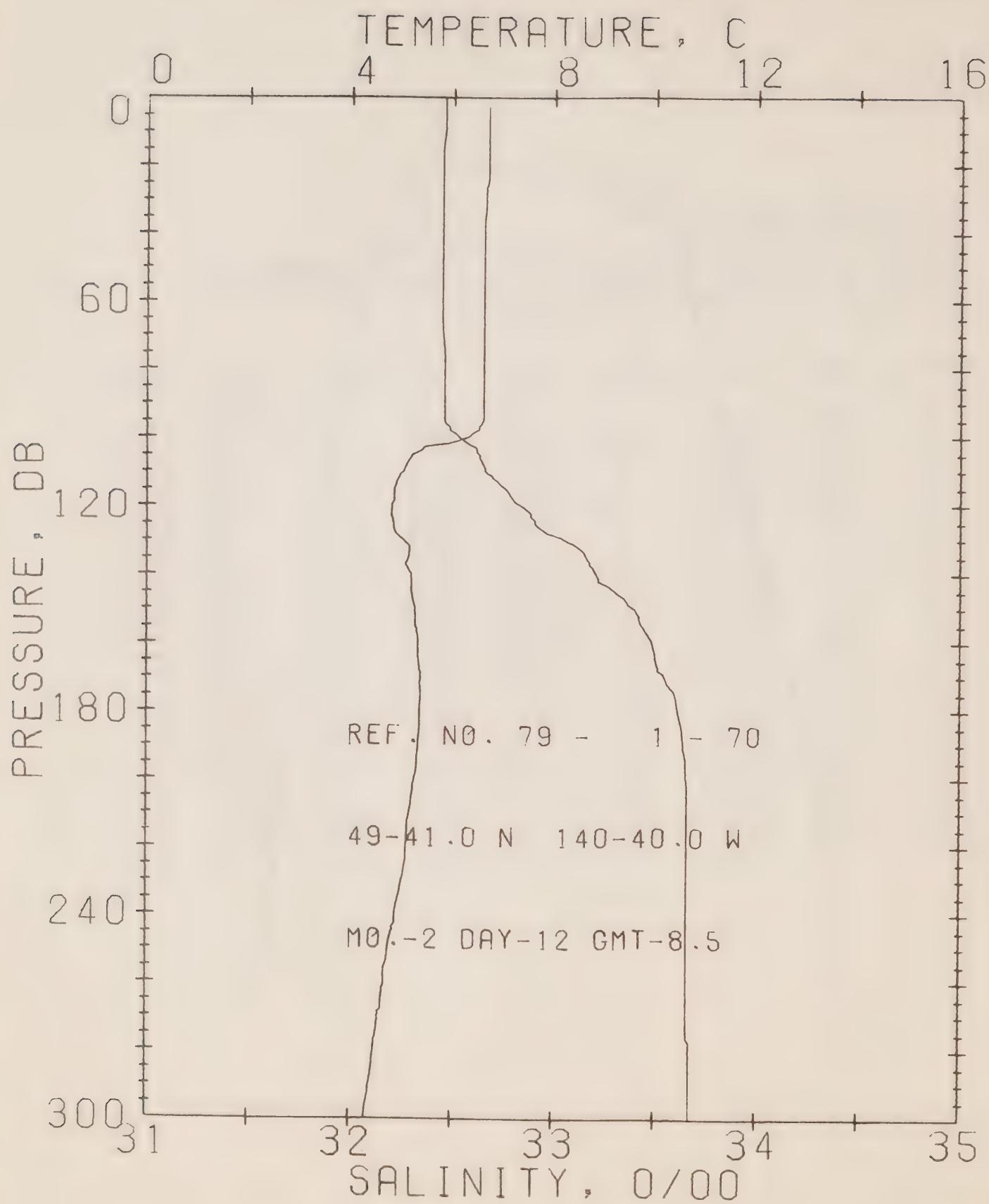
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 69 DATE 12/ 2/79

POSITION 49-49.0N, 142-40.0W GMT 1.2 STATION 12

RESULTS OF STP CAST 281 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.69	32.45	0	25.48	251.2	.00	.00	1474.
10	6.70	32.46	10	25.48	250.7	.25	.01	1475.
20	6.71	32.46	20	25.48	251.0	.50	.05	1475.
30	6.72	32.46	30	25.48	251.2	.75	.12	1475.
50	6.72	32.46	50	25.48	251.2	1.26	.32	1475.
75	6.73	32.48	75	25.50	250.4	1.88	.72	1476.
100	6.72	32.49	99	25.50	249.9	2.51	1.28	1476.
125	5.02	33.10	124	26.19	184.5	3.05	1.90	1471.
150	5.55	33.54	149	26.48	157.9	3.48	2.50	1474.
175	5.53	33.66	174	26.58	149.0	3.86	3.13	1474.
200	5.30	33.67	199	26.61	145.8	4.23	3.83	1474.
225	4.95	33.67	223	26.65	142.1	4.59	4.61	1473.
250	4.74	33.67	248	26.67	140.0	4.94	5.47	1472.
300	4.39	33.67	298	26.71	136.7	5.64	7.40	1472.
400	4.01	33.78	397	26.84	125.3	6.95	12.07	1472.
500	3.75	33.86	496	26.93	117.6	8.16	17.65	1472.
600	3.58	33.97	595	27.03	108.1	9.29	23.95	1473.
800	3.10	34.13	793	27.21	92.1	11.28	38.12	1475.
1000	2.69	34.27	990	27.35	78.7	12.99	53.75	1477.
1200	2.45	34.39	1188	27.47	68.3	14.46	70.23	1479.



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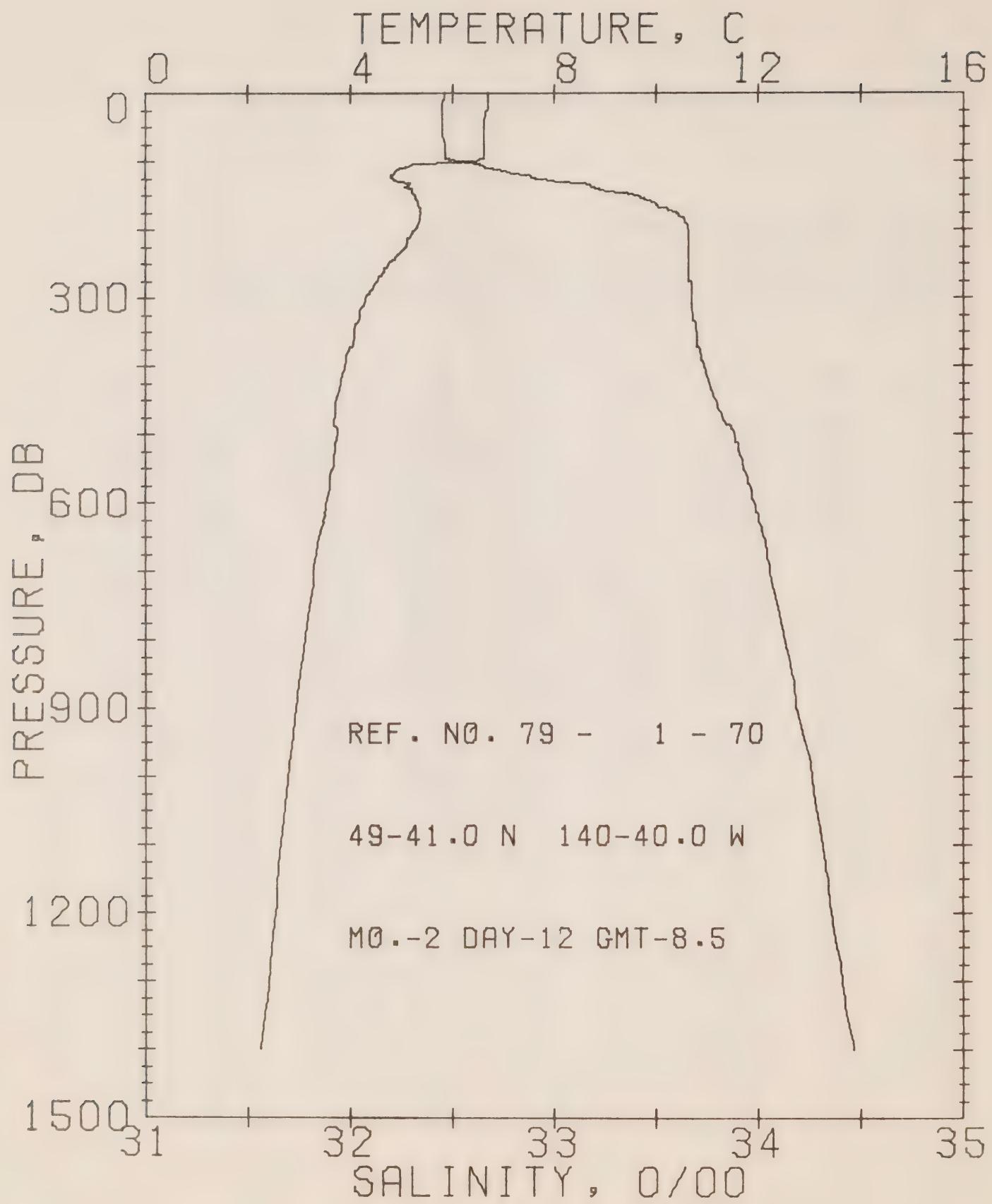
REFERENCE NO. 79- 1- 70 DATE 12/ 2/79

POSITION 49-41.0N, 140-40.0W GMT 8.5 STATION 11

RESULTS OF SIP CAST 138 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA 0	POT. EN	SOUND
0	6.70	32.46	0	25.46	250.6	.00	.00	1475.
10	6.70	32.46	10	25.46	250.7	.25	.01	1475.
20	6.69	32.45	20	25.48	251.5	.50	.05	1475.
30	6.64	32.45	30	25.48	251.0	.75	.12	1475.
40	6.62	32.45	40	25.49	250.9	1.00	.20	1475.
50	6.62	32.45	50	25.49	251.0	1.26	.32	1475.
60	6.62	32.45	60	25.49	251.1	1.51	.46	1475.
70	6.62	32.45	70	25.49	250.9	1.76	.63	1475.
80	6.62	32.46	80	25.49	250.6	2.01	.82	1476.
90	6.62	32.46	90	25.49	250.7	2.26	1.04	1476.
100	6.31	32.53	99	25.59	241.8	2.51	1.28	1475.
110	5.05	32.66	109	25.84	217.7	2.73	1.52	1470.
120	4.81	32.84	119	26.01	201.7	2.94	1.76	1469.
130	5.04	33.05	129	26.15	188.5	3.14	2.01	1471.
140	5.20	33.21	139	26.26	178.4	3.32	2.26	1472.
150	5.27	33.46	149	26.40	165.1	3.49	2.52	1472.
160	5.34	33.46	159	26.46	159.7	3.65	2.77	1473.
170	5.38	33.55	169	26.50	155.8	3.81	3.04	1473.
180	5.37	33.61	179	26.55	150.9	3.96	3.31	1474.
190	5.33	33.64	189	26.58	148.4	4.11	3.59	1474.
200	5.26	33.65	199	26.60	146.6	4.26	3.89	1474.
210	5.15	33.66	209	26.62	145.0	4.41	4.19	1473.
220	5.10	33.66	218	26.63	144.5	4.55	4.51	1473.
230	5.01	33.66	228	26.64	143.6	4.70	4.84	1473.
240	4.88	33.66	238	26.65	142.2	4.84	5.18	1473.
250	4.75	33.66	248	26.66	140.9	4.98	5.53	1472.
260	4.67	33.66	258	26.67	140.1	5.12	5.90	1472.
270	4.50	33.66	268	26.69	139.0	5.26	6.28	1472.
280	4.47	33.67	278	26.70	137.4	5.40	6.66	1472.
290	4.39	33.67	288	26.71	135.6	5.54	7.06	1471.
300	4.30	33.67	298	26.72	135.7	5.67	7.47	1471.



OFFSHORE OCEANOGRAPHY GROUP

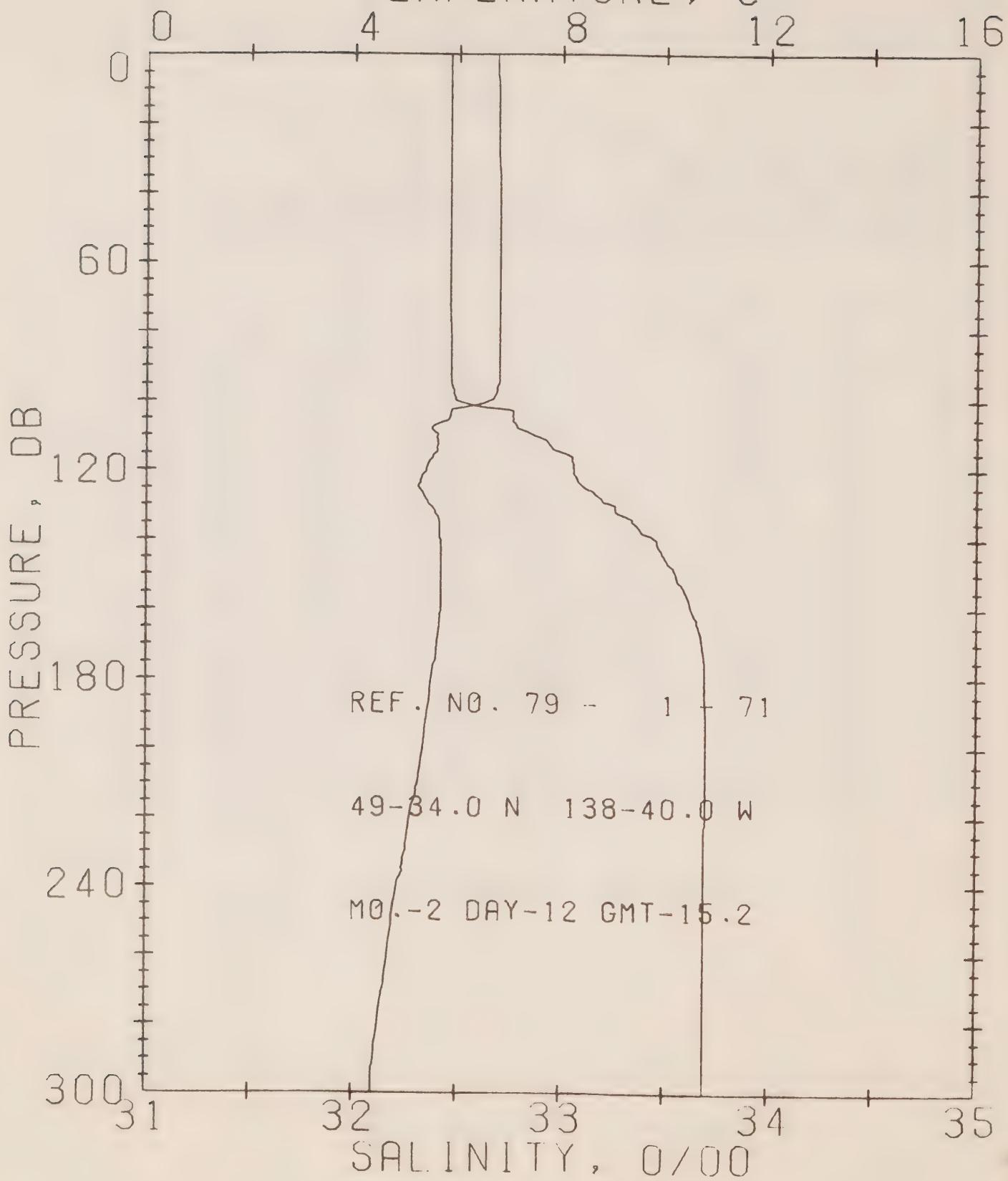
REFERENCE NO. 79- 1- 70 DATE 12/ 2/79

POSITION 49-41.0N, 140-40.0W GMT 8.5 STATION 11

RESULTS OF STP CAST 247 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA	SVA	DELTA	POT.	SOUND
				T	D	EN		
0	6.70	32.46	0	25.46	250.6	.00	.00	1475.
10	6.70	32.46	10	25.46	250.7	.25	.01	1475.
20	6.69	32.45	20	25.46	251.5	.50	.05	1475.
30	6.64	32.45	30	25.48	251.0	.75	.12	1475.
50	6.62	32.45	50	25.49	251.0	1.26	.32	1475.
75	6.62	32.46	75	25.49	250.6	1.88	.72	1475.
100	6.31	32.53	99	25.59	241.8	2.51	1.28	1475.
125	4.86	32.91	124	26.06	197.0	3.04	1.89	1470.
150	5.27	33.46	149	26.40	165.1	3.49	2.52	1472.
175	5.38	33.60	174	26.55	151.7	3.89	3.17	1474.
200	5.26	33.65	199	26.60	146.6	4.26	3.89	1474.
225	5.07	33.66	223	26.63	144.3	4.62	4.67	1473.
250	4.75	33.66	248	26.66	140.9	4.98	5.53	1472.
300	4.30	33.67	298	26.72	135.7	5.67	7.47	1471.
400	3.89	33.73	397	26.81	127.8	6.99	12.18	1471.
500	3.75	33.86	496	26.95	115.6	8.21	17.76	1472.
600	3.52	33.96	595	27.04	106.8	9.33	23.99	1473.
800	3.11	34.12	793	27.26	93.0	11.32	38.16	1475.
1000	2.77	34.26	991	27.34	80.6	13.05	54.05	1477.
1200	2.53	34.36	1188	27.44	71.8	14.57	71.04	1479.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

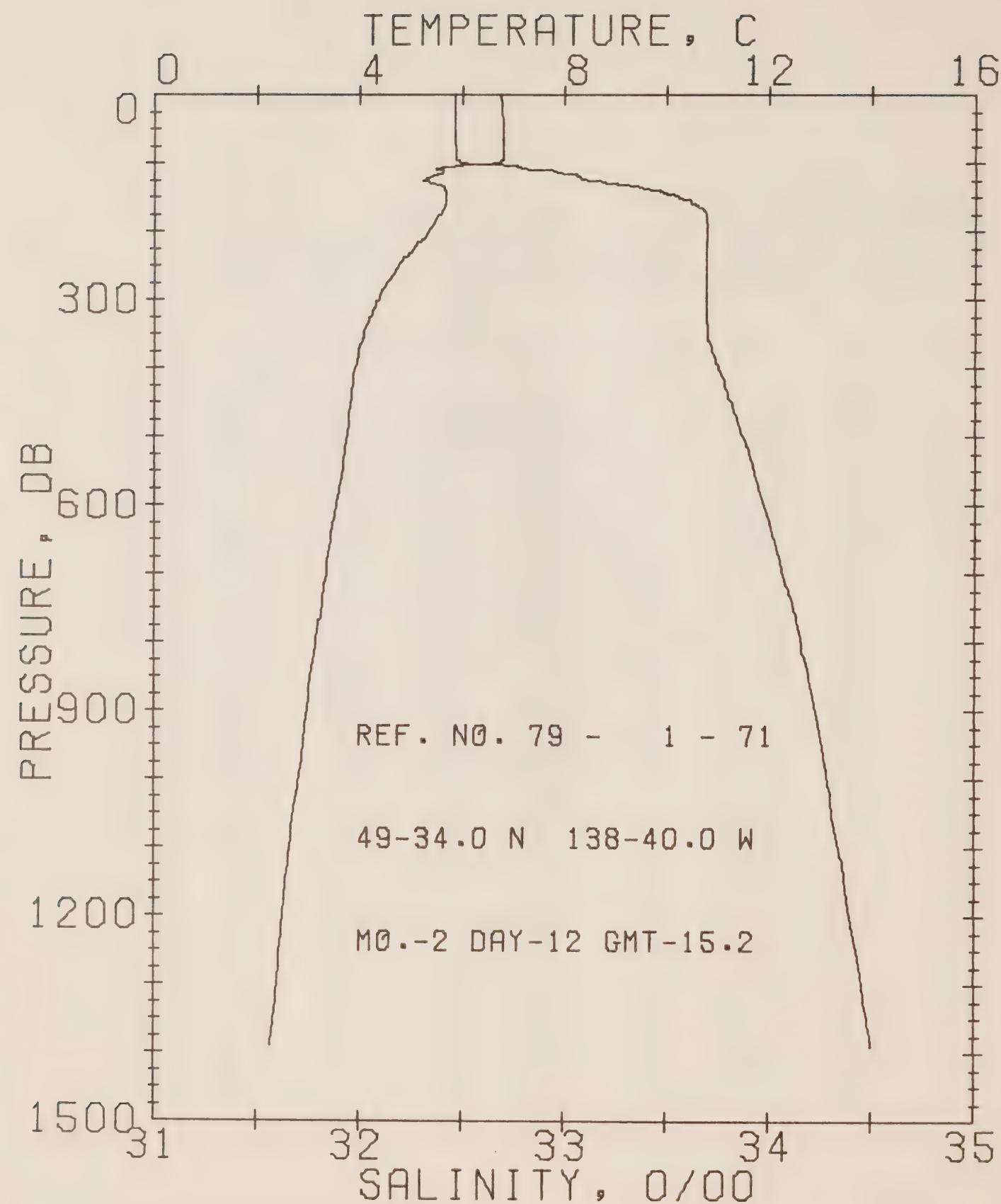
REFERENCE NO. 79- 1- 71

DATE 12/ 2/79

POSITION 49-34.0N, 138-40.0W GMT 15.2 STATION 10

RESULTS OF STP CAST 158 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DLPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.76	32.46	0	25.48	251.4	.00	.00	1475.
10	6.78	32.46	10	25.47	251.7	.25	.01	1475.
20	6.78	32.46	20	25.47	251.9	.50	.05	1475.
30	6.78	32.46	30	25.47	252.0	.76	.12	1475.
40	6.79	32.46	40	25.47	252.2	1.01	.21	1476.
50	6.79	32.46	50	25.47	252.4	1.26	.32	1476.
60	6.79	32.46	60	25.47	252.5	1.51	.46	1476.
70	6.79	32.46	70	25.47	252.6	1.76	.63	1476.
80	6.80	32.47	80	25.48	252.2	2.02	.82	1476.
90	6.80	32.47	89	25.48	252.2	2.27	1.04	1476.
100	6.67	32.49	99	25.51	249.2	2.52	1.29	1476.
110	5.63	32.87	109	25.94	208.4	2.74	1.52	1473.
120	5.38	33.06	119	26.12	191.5	2.94	1.75	1472.
130	5.44	33.26	129	26.27	177.3	3.13	1.99	1473.
140	5.66	33.46	139	26.40	165.1	3.30	2.23	1474.
150	5.69	33.55	149	26.47	158.8	3.46	2.47	1474.
160	5.68	33.62	159	26.53	153.1	3.62	2.71	1475.
170	5.60	33.68	169	26.58	148.3	3.77	2.97	1474.
180	5.50	33.69	179	26.60	146.5	3.92	3.23	1474.
190	5.43	33.70	189	26.62	145.2	4.06	3.51	1474.
200	5.34	33.70	199	26.63	144.0	4.21	3.79	1474.
210	5.24	33.70	209	26.64	143.0	4.35	4.09	1474.
220	5.10	33.70	218	26.66	141.5	4.49	4.40	1473.
230	5.00	33.69	228	26.66	141.2	4.63	4.73	1473.
240	4.85	33.69	238	26.68	139.7	4.77	5.07	1473.
250	4.75	33.69	248	26.69	138.7	4.91	5.41	1472.
260	4.67	33.69	258	26.70	137.8	5.05	5.77	1472.
270	4.58	33.69	268	26.71	137.0	5.19	6.14	1472.
280	4.49	33.69	278	26.72	136.0	5.32	6.53	1472.
290	4.42	33.69	288	26.72	135.4	5.46	6.92	1472.
300	4.36	33.69	298	26.73	134.9	5.60	7.33	1471.



OFFSHORE OCEANOGRAPHY GROUP

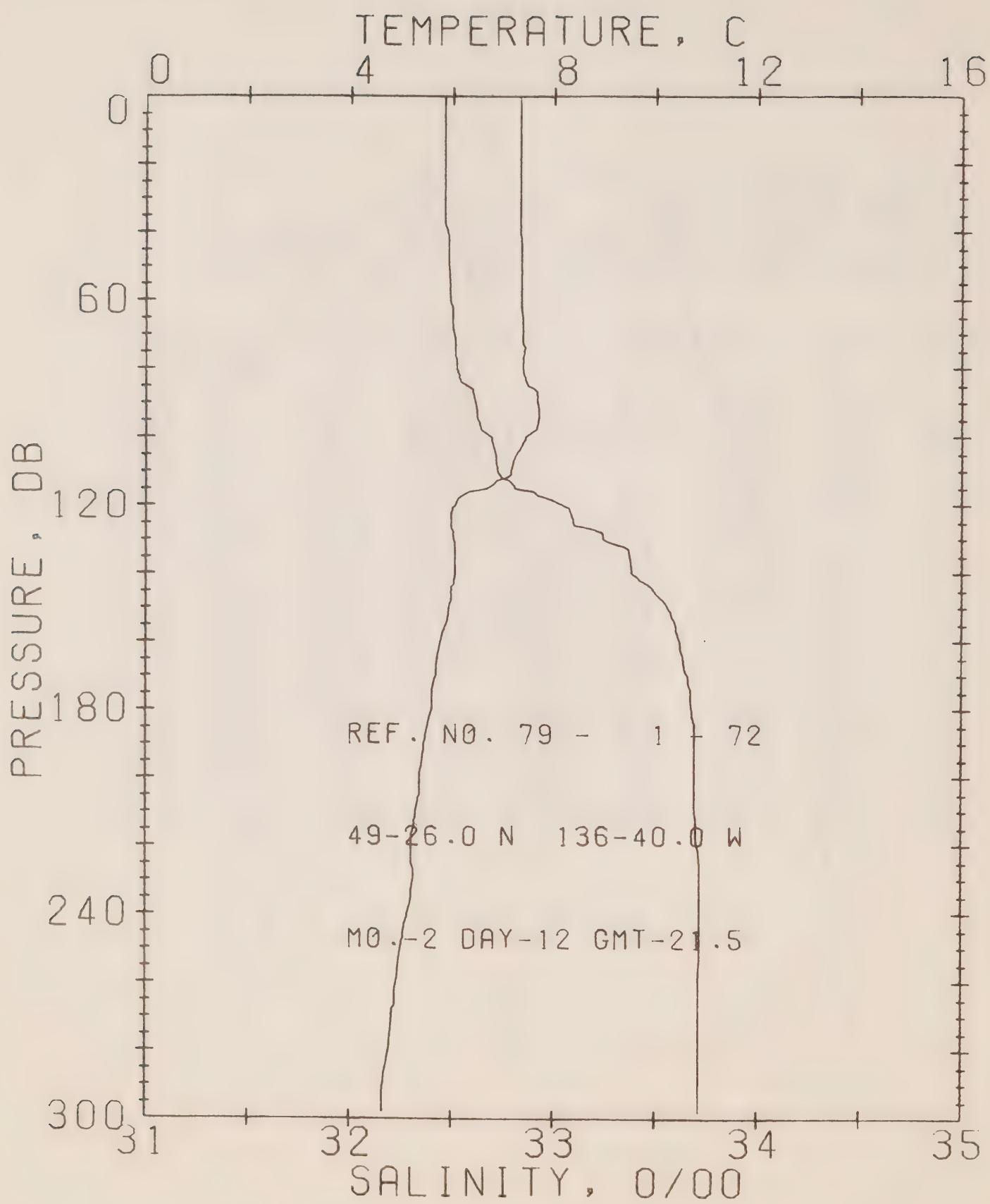
REFERENCE NO. 79- 1- 71

DATE 12/ 2/79

POSITION 49-34.0N, 138-40.0W GMT 15.2 STATION 10

RESULTS OF STP CAST 254 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED,PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.76	32.46	0	25.46	251.4	.00	.00	1475.
10	6.78	32.46	10	25.47	251.7	.25	.01	1475.
20	6.78	32.46	20	25.47	251.9	.50	.05	1475.
30	6.78	32.46	30	25.47	252.0	.76	.12	1475.
50	6.79	32.46	50	25.47	252.4	1.26	.32	1476.
75	6.79	32.46	75	25.47	252.5	1.89	.72	1476.
100	6.87	32.49	99	25.51	249.2	2.52	1.29	1476.
125	5.23	33.11	124	26.18	186.1	3.03	1.87	1471.
150	5.69	33.55	149	26.47	158.8	3.46	2.47	1474.
175	5.56	33.69	174	26.60	147.1	3.84	3.10	1474.
200	5.34	33.70	199	26.63	144.0	4.21	3.79	1474.
225	5.03	33.69	223	26.66	141.5	4.56	4.57	1473.
250	4.75	33.69	248	26.69	138.7	4.91	5.41	1472.
300	4.36	33.69	298	26.73	134.9	5.60	7.33	1471.
400	3.91	33.75	397	26.82	126.4	6.91	12.00	1471.
500	3.75	33.87	496	26.93	116.7	8.12	17.55	1472.
600	3.54	33.97	595	27.04	107.3	9.24	23.81	1473.
800	3.15	34.15	793	27.22	91.0	11.22	37.39	1475.
1000	2.82	34.28	991	27.35	79.2	12.92	53.42	1477.
1200	2.50	34.39	1188	27.47	68.8	14.39	69.91	1479.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 72 DATE 12/ 2/79

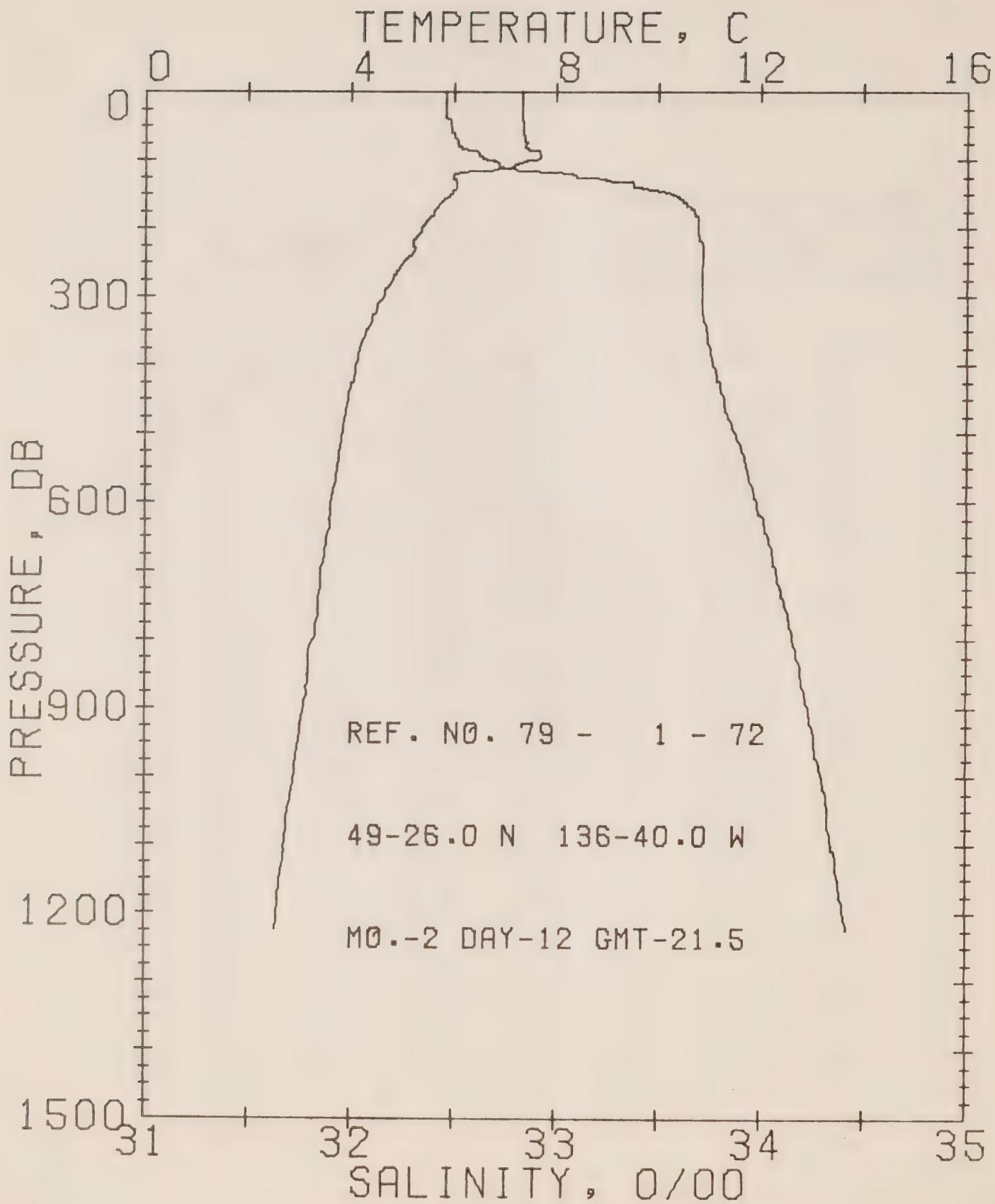
POSITION 49-26.0N, 136-40.0E GMT 21.5 STATION 9

RESULTS OF STP CAST 147 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.32	32.46	0	25.40	258.5	.00	.00	1477.
10	7.32	32.46	10	25.40	258.6	.26	.01	1477.
20	7.32	32.46	20	25.40	258.8	.52	.05	1477.
30	7.33	32.46	30	25.40	259.0	.78	.12	1478.
40	7.33	32.47	40	25.41	258.1	1.04	.21	1478.
50	7.35	32.48	50	25.41	258.0	1.29	.33	1478.
60	7.35	32.49	60	25.42	257.5	1.55	.47	1478.
70	7.39	32.51	70	25.43	256.9	1.81	.64	1478.
80	7.40	32.52	80	25.44	256.2	2.06	.84	1479.
90	7.69	32.61	99	25.47	253.5	2.32	1.06	1480.
100	7.44	32.69	99	25.56	244.3	2.57	1.30	1479.
110	7.15	32.72	109	25.63	238.4	2.81	1.56	1478.
120	6.05	33.04	119	26.02	200.8	3.03	1.82	1475.
130	6.03	33.24	129	26.18	185.8	3.23	2.07	1475.
140	6.05	33.38	139	26.29	175.7	3.40	2.31	1475.
150	5.93	33.56	149	26.45	160.9	3.57	2.56	1475.
160	5.76	33.62	159	26.52	154.5	3.73	2.81	1475.
170	5.67	33.66	169	26.56	150.6	3.88	3.07	1475.
180	5.59	33.66	179	26.58	148.3	4.03	3.33	1475.
190	5.45	33.69	189	26.61	146.0	4.18	3.61	1474.
200	5.36	33.69	199	26.62	145.1	4.32	3.90	1474.
210	5.29	33.69	219	26.63	144.3	4.47	4.20	1474.
220	5.19	33.76	218	26.65	142.2	4.61	4.51	1474.
230	5.23	33.72	228	26.66	141.6	4.75	4.84	1474.
240	5.13	33.72	238	26.67	140.6	4.89	5.18	1474.
250	4.99	33.72	248	26.68	139.1	5.03	5.53	1473.
260	4.91	33.71	258	26.69	139.0	5.17	5.89	1473.
270	4.82	33.71	268	26.70	138.1	5.31	6.26	1473.
280	4.76	33.71	278	26.76	137.5	5.45	6.65	1473.
290	4.66	33.71	288	26.71	136.5	5.59	7.05	1473.
300	4.62	33.71	298	26.72	136.1	5.72	7.46	1473.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 72 DATE 12/ 2/79

POSITION 49-26.0N, 136-40.0W GMT 21.5 STATION 9

RESULTS OF STP CAST 267 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.32	32.46	0	25.40	258.5	.00	.00	1477.
10	7.32	32.46	10	25.40	258.6	.26	.01	1477.
20	7.32	32.46	20	25.40	258.8	.52	.05	1477.
30	7.33	32.46	30	25.41	259.0	.78	.12	1478.
50	7.35	32.46	50	25.41	258.0	1.29	.33	1478.
75	7.41	32.51	75	25.43	257.0	1.94	.74	1479.
100	7.44	32.69	99	25.56	244.3	2.57	1.30	1479.
125	5.98	33.09	124	26.07	196.3	3.13	1.94	1475.
150	5.93	33.56	149	26.45	160.9	3.57	2.56	1475.
175	5.61	33.67	174	26.57	149.2	3.96	3.20	1475.
200	5.36	33.69	199	26.62	145.1	4.32	3.90	1474.
225	5.19	33.72	223	26.66	141.1	4.68	4.68	1474.
250	4.99	33.72	248	26.69	139.1	5.03	5.53	1473.
300	4.62	33.71	298	26.72	136.1	5.72	7.46	1473.
400	4.09	33.77	397	26.82	126.9	7.04	12.14	1472.
500	3.83	33.87	496	26.93	117.2	8.26	17.74	1473.
600	3.61	33.98	595	27.04	107.6	9.38	24.03	1474.
800	3.25	34.15	793	27.21	92.4	11.38	38.22	1476.
1000	2.88	34.30	991	27.36	79.0	13.09	53.87	1478.
1200	2.56	34.40	1188	27.47	68.7	14.56	70.35	1480.

TEMPERATURE, C

PRESSURE, DB

0
60
120
180
240
300

REF. NO. 79 - 1 - 73

49-17.0 N 134-40.0 W

MO. 2 DAY-13 GMT-4.1

31 32 33 34 35

SALINITY, O/00

0 4 8 12 16

OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 73

DATE 13/ 2/79

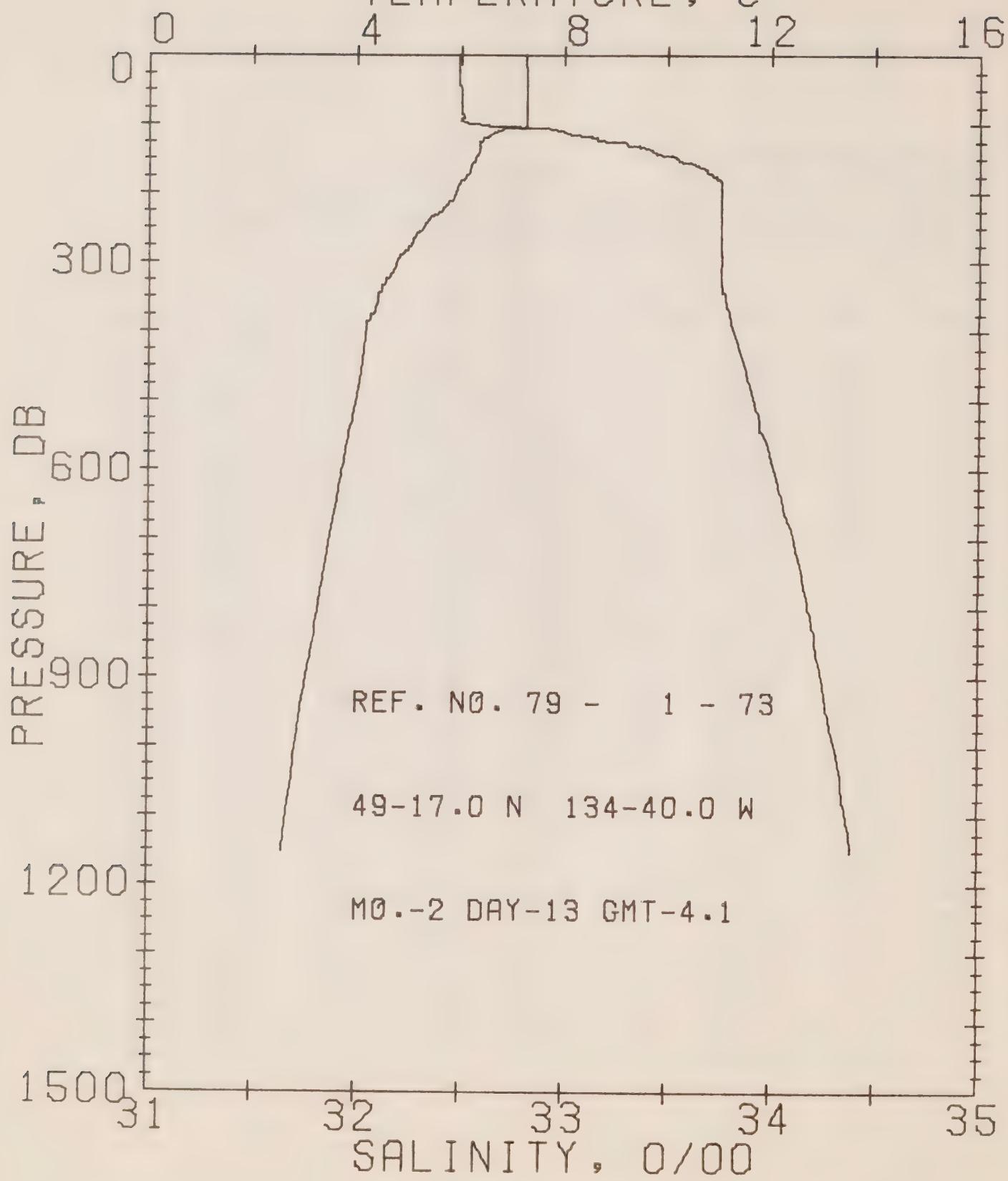
POSITION 49-17.0N. 134-40.0W GM1 4.1 STATION 8

RESULTS OF STP CAST 151 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.26	32.49	0	25.43	255.5	.00	.00	1477.
10	7.26	32.49	10	25.43	255.6	.26	.01	1477.
20	7.28	32.49	20	25.43	256.0	.51	.05	1477.
30	7.28	32.49	30	25.43	256.2	.77	.12	1477.
40	7.28	32.49	40	25.43	256.3	1.02	.21	1478.
50	7.29	32.50	50	25.44	255.9	1.28	.33	1478.
60	7.29	32.50	60	25.44	255.9	1.54	.47	1478.
70	7.29	32.50	70	25.44	256.1	1.79	.64	1478.
80	7.29	32.50	80	25.44	256.2	2.05	.84	1478.
90	7.29	32.51	90	25.44	255.8	2.30	1.06	1478.
100	7.29	32.55	99	25.46	252.8	2.56	1.30	1479.
110	6.69	32.98	109	25.89	213.1	2.79	1.55	1477.
120	6.50	33.13	119	26.04	199.6	3.00	1.80	1477.
130	6.35	33.30	129	26.19	185.0	3.19	2.04	1476.
140	6.34	33.42	139	26.29	176.0	3.37	2.29	1477.
150	6.28	33.54	149	26.39	166.7	3.54	2.54	1477.
160	6.19	33.63	159	26.47	159.0	3.71	2.80	1477.
170	6.15	33.69	169	26.52	154.2	3.86	3.06	1477.
180	6.05	33.74	179	26.58	149.1	4.02	3.33	1477.
190	5.94	33.70	189	26.60	146.6	4.16	3.61	1476.
200	5.90	33.70	199	26.61	146.2	4.31	3.90	1476.
210	5.84	33.70	209	26.62	145.7	4.45	4.21	1476.
220	5.69	33.76	218	26.64	143.9	4.60	4.52	1476.
230	5.54	33.76	228	26.65	142.3	4.74	4.85	1475.
240	5.30	33.76	238	26.67	140.3	4.88	5.19	1475.
250	5.27	33.76	248	26.68	139.3	5.02	5.54	1475.
260	5.13	33.70	258	26.70	137.8	5.16	5.90	1474.
270	5.00	33.76	268	26.71	137.1	5.30	6.27	1474.
280	4.98	33.76	278	26.72	136.3	5.44	6.66	1474.
290	4.84	33.76	288	26.73	134.8	5.57	7.05	1473.
300	4.76	33.77	298	26.75	133.3	5.71	7.45	1473.

TEMPERATURE, C



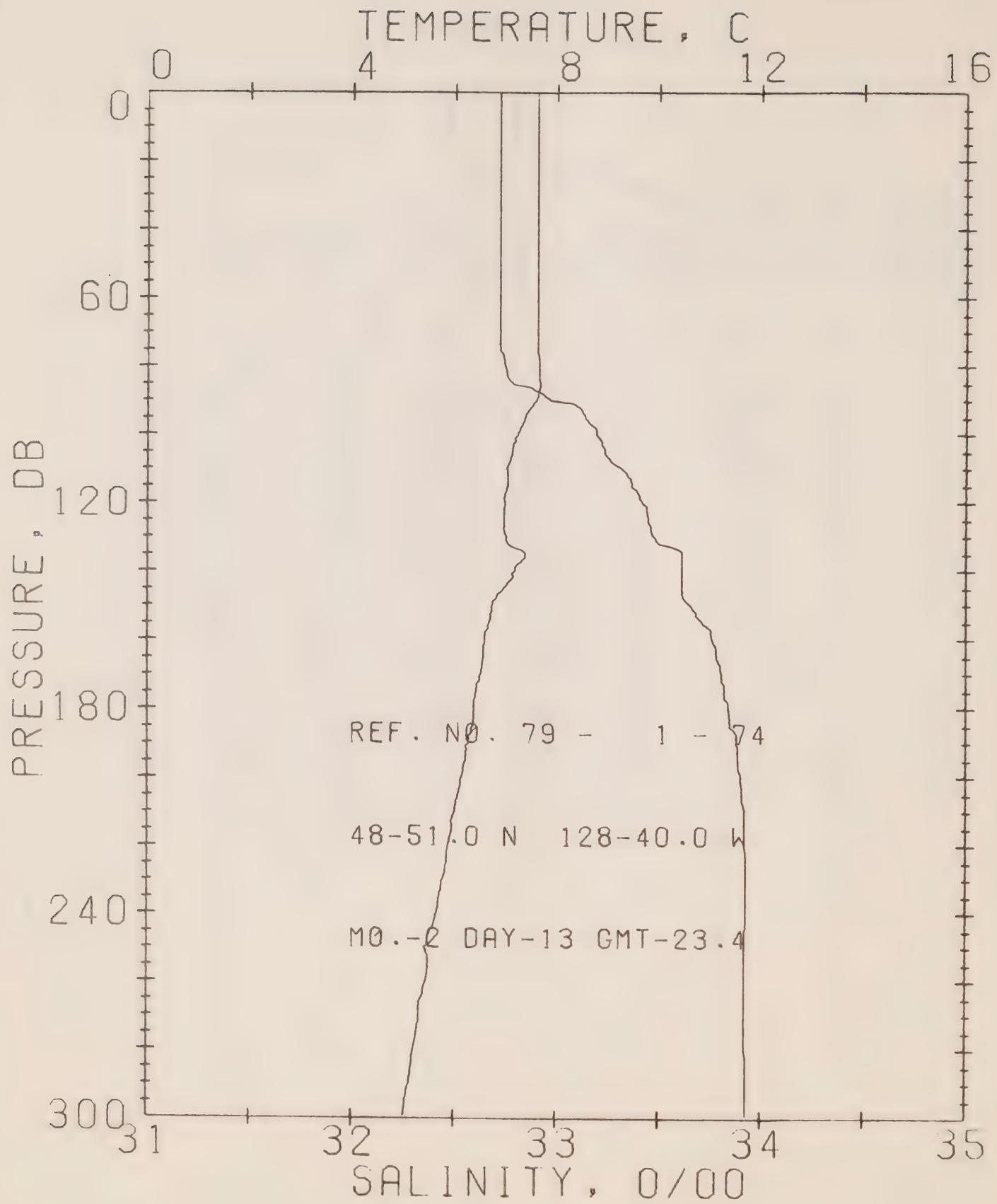
OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 73 DATE 13/ 2/79

POSITION 49-17.0N, 134-40.6W GMT 4.1 STATION 8

RESULTS OF STD CAST 227 POINTS TAKEN FROM ANALOG TRACE
GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	GVA	DELTA D	POT. EN	SOUND
0	7.26	32.49	0	25.43	255.5	.00	.00	1477.
10	7.26	32.49	10	25.43	255.6	.26	.01	1477.
20	7.28	32.49	20	25.43	256.0	.51	.05	1477.
30	7.28	32.49	30	25.43	256.2	.77	.12	1477.
50	7.29	32.50	50	25.44	255.9	1.28	.33	1478.
75	7.29	32.50	75	25.44	256.1	1.92	.73	1478.
100	7.29	32.55	99	25.48	252.8	2.56	1.30	1479.
125	8.35	33.20	124	26.11	192.6	3.10	1.92	1476.
150	8.28	33.54	149	26.39	166.7	3.54	2.54	1477.
175	8.09	33.72	174	26.55	151.3	3.94	3.20	1477.
200	8.90	33.76	199	26.61	146.2	4.31	3.90	1476.
225	8.63	33.76	223	26.64	143.4	4.67	4.69	1476.
250	8.27	33.76	248	26.66	139.3	5.02	5.54	1475.
300	4.76	33.77	298	26.75	133.3	5.71	7.45	1473.
400	4.17	33.82	397	26.85	124.0	7.00	12.06	1473.
500	3.98	33.92	496	26.95	115.5	8.20	17.54	1473.
600	3.72	34.01	595	27.05	106.4	9.30	23.74	1474.
800	3.26	34.18	793	27.23	90.4	11.27	37.68	1476.
1000	2.83	34.31	991	27.37	77.4	12.94	53.04	1477.



OFFSHORE OCEANOGRAPHY GROUP

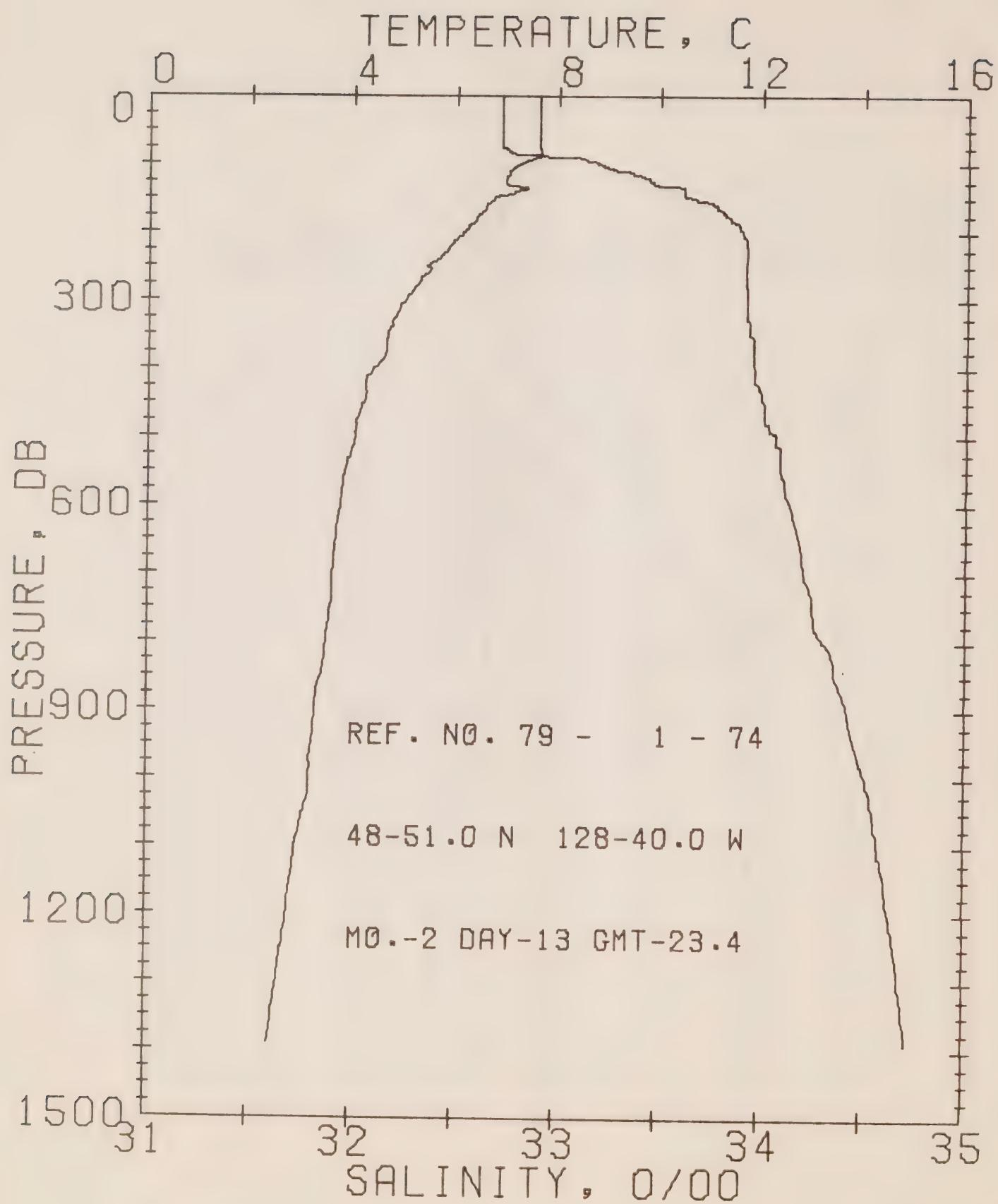
REFERENCE NO. 79- 1- 74 DATE 13/ 2/79

POSITION 48-51.0N, 128-40.0W GMT 23.4 STATION 5

RESULTS OF STP CAST 163 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.63	32.72	0	25.56	243.2	.00	.00	1479.
10	7.63	32.72	10	25.56	243.4	.24	.01	1479.
20	7.63	32.72	20	25.56	243.5	.49	.05	1479.
30	7.64	32.72	30	25.56	243.8	.73	.11	1479.
40	7.64	32.72	40	25.56	243.9	.97	.20	1479.
50	7.64	32.72	50	25.56	244.1	1.22	.31	1479.
60	7.64	32.72	60	25.56	244.2	1.46	.45	1480.
70	7.64	32.72	70	25.56	244.4	1.71	.61	1480.
80	7.65	32.74	80	25.56	242.8	1.95	.80	1480.
90	7.61	32.97	89	25.76	225.7	2.19	1.00	1480.
100	7.23	33.19	99	25.99	204.4	2.40	1.20	1479.
110	7.02	33.32	109	26.12	192.0	2.60	1.42	1479.
120	6.98	33.42	119	26.26	184.2	2.78	1.64	1479.
130	7.01	33.48	129	26.24	180.3	2.97	1.87	1479.
140	7.17	33.61	139	26.32	172.9	3.14	2.11	1480.
150	6.72	33.65	149	26.42	164.1	3.31	2.36	1479.
160	6.60	33.76	159	26.52	154.5	3.47	2.61	1478.
170	6.51	33.81	169	26.57	149.8	3.62	2.87	1478.
180	6.37	33.84	179	26.61	145.9	3.77	3.13	1478.
190	6.26	33.88	189	26.66	141.7	3.91	3.40	1478.
200	6.13	33.90	199	26.69	138.7	4.05	3.68	1477.
210	5.99	33.92	209	26.72	135.6	4.19	3.97	1477.
220	5.88	33.92	218	26.74	134.4	4.33	4.26	1477.
230	5.77	33.93	228	26.76	132.4	4.46	4.57	1476.
240	5.64	33.93	238	26.77	131.0	4.59	4.88	1476.
250	5.42	33.92	248	26.79	129.2	4.72	5.21	1475.
260	5.43	33.92	258	26.79	129.4	4.85	5.55	1476.
270	5.31	33.92	268	26.81	128.1	4.98	5.89	1475.
280	5.21	33.92	278	26.82	127.0	5.11	6.25	1475.
290	5.11	33.93	288	26.84	125.2	5.23	6.62	1475.
300	5.00	33.93	298	26.85	124.1	5.36	6.99	1474.



OFFSHORE OCEANOGRAPHY GROUP

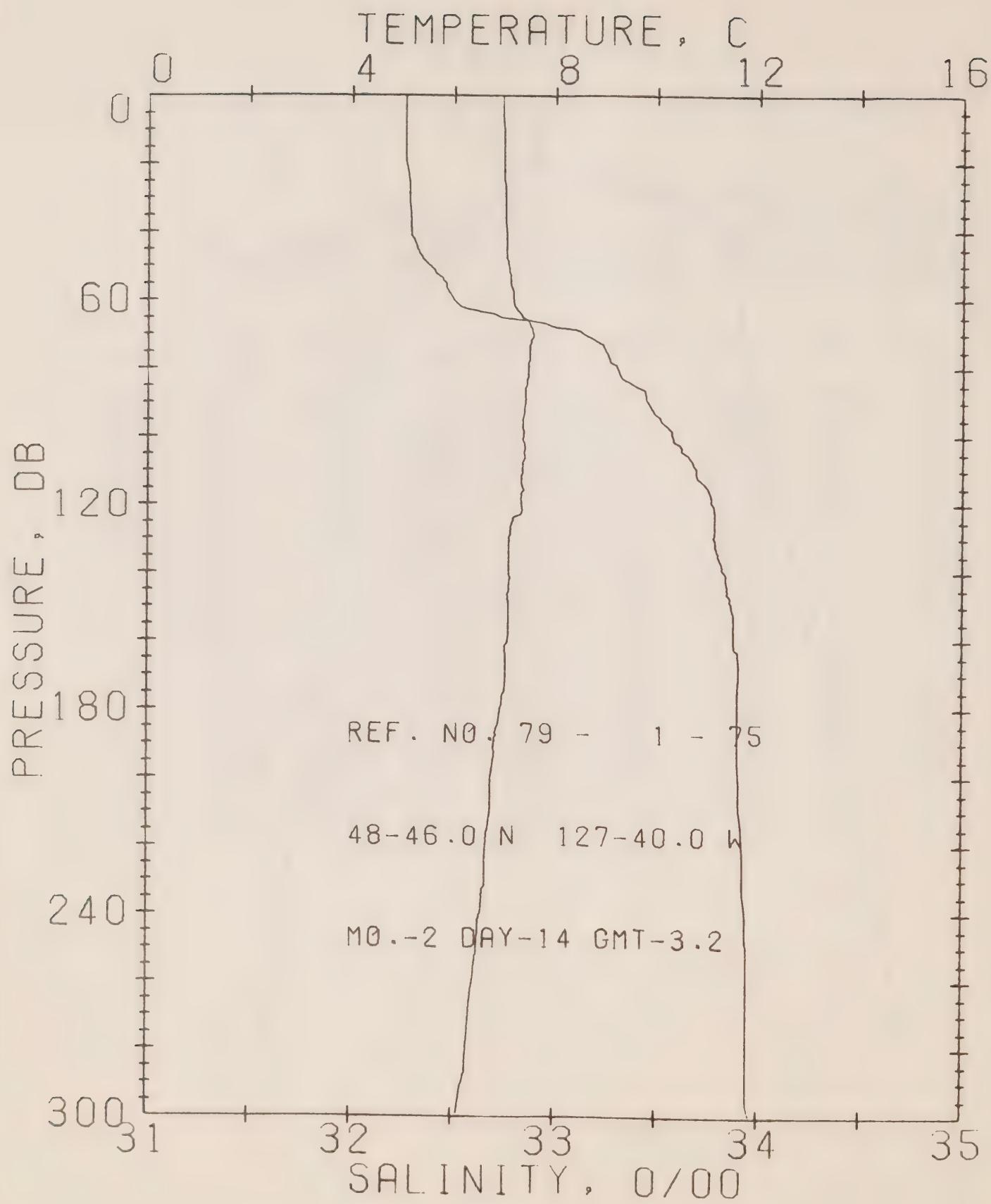
REFERENCE NO. 79- 1- 74 DATE 13/ 2/79

POSITION 48-51.0N, 128-40.6W GMT 23.4 STATION 5

RESULTS OF STD CAST 367 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.63	32.72	0	25.56	243.2	.00	.00	1479.
10	7.63	32.72	10	25.56	243.4	.24	.01	1479.
20	7.63	32.72	20	25.56	243.5	.49	.05	1479.
30	7.64	32.72	30	25.56	243.8	.73	.11	1479.
50	7.64	32.72	50	25.56	244.1	1.22	.31	1479.
75	7.64	32.72	75	25.56	244.5	1.83	.70	1480.
100	7.23	33.19	99	25.99	204.4	2.40	1.20	1479.
125	6.96	33.45	124	26.23	161.8	2.88	1.75	1479.
150	6.72	33.65	149	26.42	164.1	3.31	2.36	1479.
175	6.42	33.82	174	26.59	147.9	3.70	3.00	1478.
200	6.13	33.90	199	26.69	138.7	4.05	3.68	1477.
225	5.84	33.93	223	26.75	133.2	4.39	4.42	1477.
250	5.42	33.92	248	26.79	129.2	4.72	5.21	1475.
300	5.00	33.93	298	26.85	124.1	5.36	6.99	1474.
400	4.36	33.97	397	26.95	114.9	6.56	11.27	1474.
500	4.06	34.07	496	27.06	105.0	7.67	16.34	1474.
600	3.76	34.14	595	27.15	97.4	8.68	22.01	1474.
600	3.49	34.31	793	27.31	83.3	10.50	34.95	1477.
1000	3.18	34.51	990	27.50	66.1	11.97	48.46	1479.
1200	2.76	34.63	1188	27.64	54.0	13.17	61.81	1481.



OFFSHORE OCEANOGRAPHY GROUP

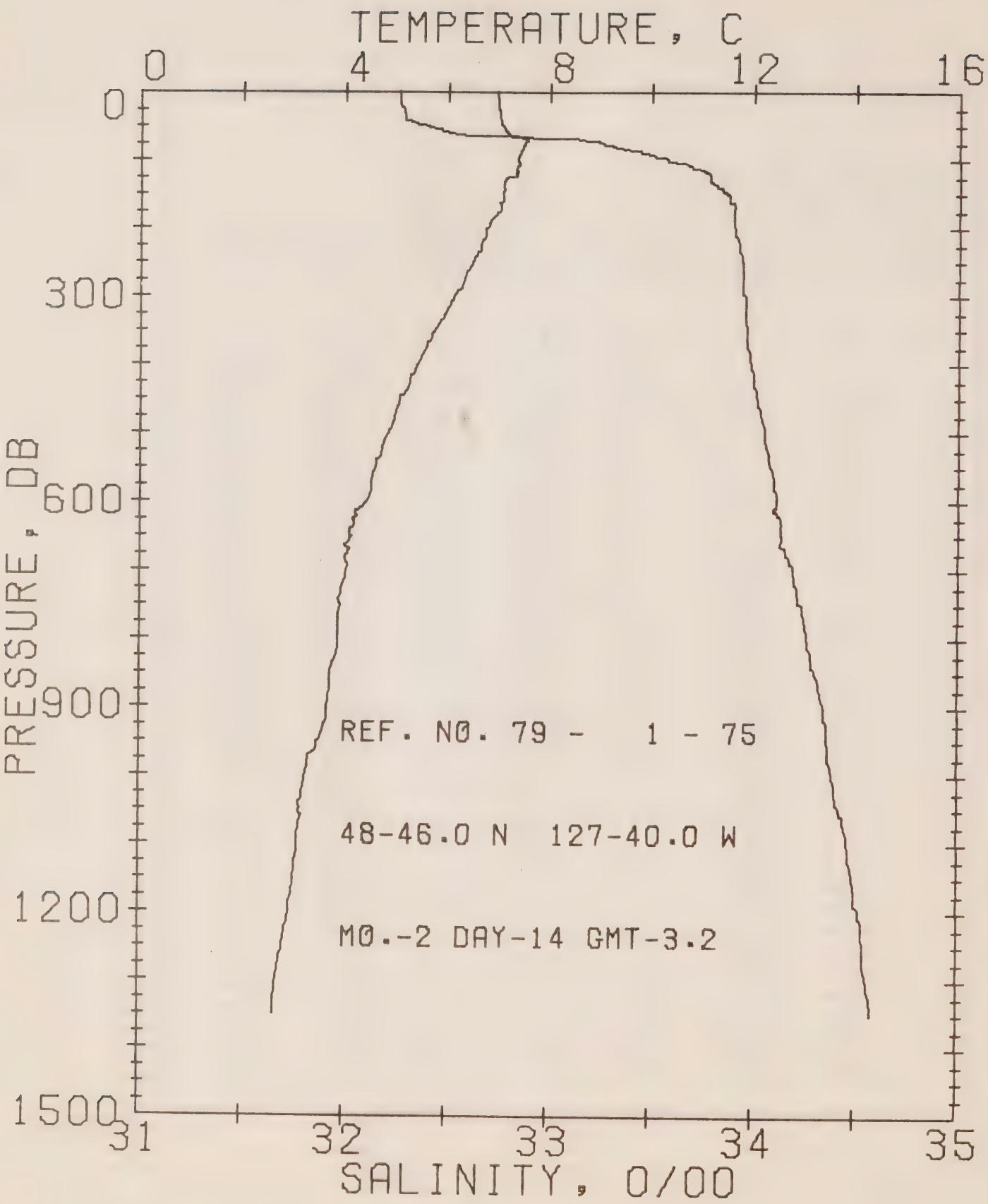
REFERENCE NO. 79- 1- 75 DATE 14/ 2/79

POSITION 48-46.0N, 127-40.0W GMT 3.2 STATION 4

RESULTS OF SGT CAST 100 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.97	32.26	0	25.29	268.9	.00	.00	1475.
10	6.98	32.26	10	25.29	269.2	.27	.01	1476.
20	6.99	32.26	20	25.29	269.0	.54	.05	1476.
30	7.01	32.28	30	25.30	268.3	.81	.12	1476.
40	7.03	32.29	40	25.31	267.9	1.07	.22	1476.
50	7.07	32.38	50	25.37	262.0	1.34	.34	1477.
60	7.18	32.50	60	25.45	254.5	1.60	.48	1477.
70	7.57	33.14	70	25.90	212.2	1.83	.64	1480.
80	7.47	33.31	80	26.05	198.4	2.04	.80	1480.
90	7.41	33.46	89	26.17	186.5	2.23	.96	1480.
100	7.39	33.56	99	26.27	177.5	2.41	1.14	1480.
110	7.36	33.69	109	26.36	169.0	2.58	1.32	1481.
120	7.34	33.78	119	26.43	162.3	2.75	1.52	1481.
130	7.10	33.79	129	26.47	158.4	2.91	1.72	1480.
140	7.10	33.84	139	26.51	154.9	3.07	1.94	1480.
150	7.10	33.87	149	26.54	152.8	3.22	2.16	1480.
160	7.07	33.88	159	26.55	151.8	3.37	2.41	1480.
170	7.04	33.91	169	26.58	149.4	3.52	2.66	1481.
180	6.94	33.90	179	26.58	148.9	3.67	2.92	1480.
190	6.82	33.90	189	26.60	147.5	3.82	3.20	1480.
200	6.77	33.91	199	26.61	146.2	3.97	3.50	1480.
210	6.73	33.91	209	26.62	145.7	4.11	3.80	1480.
220	6.66	33.92	218	26.64	144.0	4.26	4.12	1480.
230	6.64	33.93	228	26.65	143.4	4.40	4.45	1480.
240	6.56	33.94	238	26.67	141.7	4.54	4.79	1480.
250	6.47	33.95	248	26.69	140.0	4.68	5.14	1480.
260	6.40	33.95	258	26.69	139.2	4.82	5.50	1480.
270	6.34	33.95	268	26.70	138.5	4.96	5.88	1479.
280	6.29	33.95	278	26.71	138.1	5.10	6.27	1479.
290	6.21	33.95	288	26.72	137.2	5.24	6.67	1479.
300	6.12	33.96	298	26.74	135.4	5.38	7.08	1479.



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REFERENCE NO. 79- 1- 75

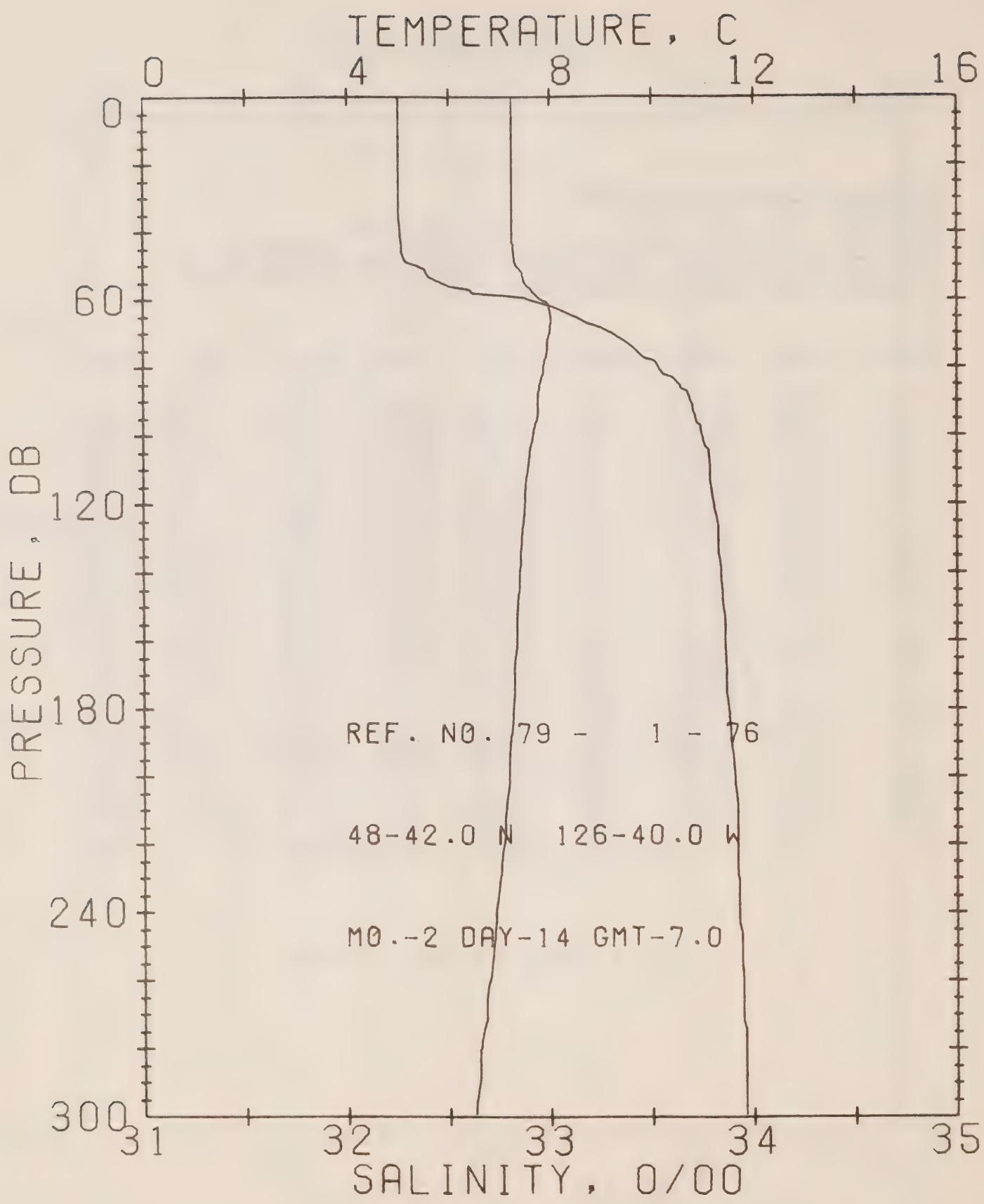
DATE 14/ 2/79

POSITION 48-46.0N, 127-40.0W GMT 3.2 STATION 4

RESULTS OF STP CAST 360 POINTS TAKEN FROM ANALOG TRACE

GUILDLINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	6.97	32.26	0	25.29	268.9	.00	.00	1475.
10	6.98	32.26	10	25.29	269.2	.27	.01	1476.
20	6.99	32.26	20	25.29	269.0	.54	.05	1476.
30	7.01	32.28	30	25.30	268.3	.81	.12	1476.
50	7.07	32.38	50	25.37	262.0	1.34	.34	1477.
75	7.50	33.25	75	26.00	203.1	1.94	.72	1480.
100	7.39	33.58	99	26.27	177.5	2.41	1.14	1480.
125	7.16	33.79	124	26.47	159.2	2.83	1.62	1480.
150	7.10	33.87	149	26.54	152.8	3.22	2.16	1480.
175	7.01	33.90	174	26.57	149.7	3.60	2.79	1480.
200	6.77	33.91	199	26.61	146.2	3.97	3.50	1480.
225	6.64	33.93	223	26.65	143.3	4.33	4.28	1480.
250	6.47	33.95	248	26.69	140.0	4.68	5.14	1480.
300	6.12	33.96	298	26.74	135.4	5.38	7.08	1479.
400	5.40	33.99	397	26.85	125.4	6.68	11.73	1478.
500	4.84	34.05	496	26.96	115.3	7.89	17.24	1477.
600	4.40	34.11	595	27.06	106.7	8.99	23.44	1477.
800	3.87	34.26	793	27.24	91.0	10.95	37.33	1478.
1000	3.24	34.39	991	27.40	76.0	12.62	52.61	1479.
1200	2.92	34.52	1188	27.53	64.1	14.02	68.27	1481.



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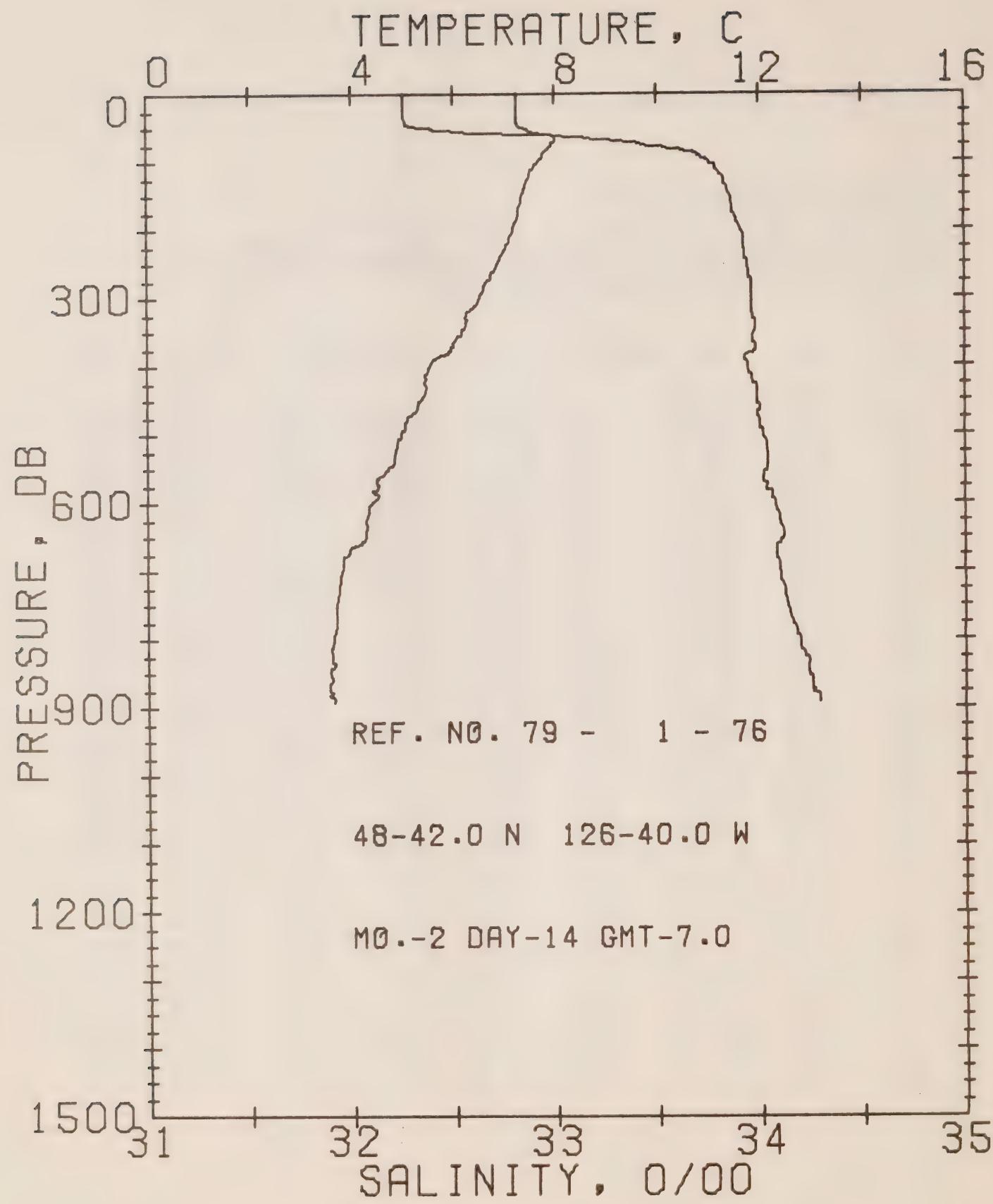
REFERENCE NO. 79- 1- 76 DATE 14/ 2/79

POSITION 48-42.0N, 126-40.0W GMT 7.0 STATION 3

RESULTS OF STP CAST 112 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.24	32.25	0	25.25	273.1	.00	.00	1478.
10	7.25	32.25	10	25.25	273.4	.27	.01	1477.
20	7.25	32.25	20	25.25	273.5	.55	.06	1477.
30	7.25	32.25	30	25.25	273.7	.82	.13	1477.
40	7.25	32.26	40	25.25	273.0	1.09	.22	1477.
50	7.32	32.35	50	25.31	267.4	1.37	.35	1478.
60	7.82	32.90	60	25.68	233.3	1.62	.49	1480.
70	7.99	33.31	70	25.97	205.4	1.84	.64	1482.
80	7.87	33.53	80	26.16	187.5	2.04	.79	1482.
90	7.77	33.69	89	26.30	174.2	2.22	.94	1482.
100	7.66	33.75	99	26.36	168.8	2.39	1.11	1482.
110	7.55	33.79	109	26.41	164.3	2.56	1.29	1481.
120	7.50	33.81	119	26.43	162.3	2.72	1.48	1481.
130	7.44	33.83	129	26.46	160.1	2.88	1.68	1481.
140	7.39	33.84	139	26.47	158.8	3.04	1.90	1481.
150	7.36	33.85	149	26.49	157.4	3.20	2.14	1481.
160	7.32	33.86	159	26.50	156.7	3.36	2.38	1481.
170	7.29	33.87	169	26.51	155.6	3.51	2.65	1481.
180	7.26	33.88	179	26.52	154.8	3.67	2.92	1482.
190	7.20	33.89	189	26.54	153.1	3.82	3.21	1481.
200	7.17	33.91	199	26.56	151.5	3.97	3.52	1482.
210	7.11	33.92	209	26.58	150.1	4.12	3.83	1481.
220	7.06	33.92	218	26.58	149.6	4.27	4.16	1481.
230	6.99	33.93	228	26.60	148.0	4.42	4.50	1481.
240	6.92	33.93	238	26.61	147.2	4.57	4.86	1481.
250	6.86	33.94	248	26.63	145.9	4.72	5.22	1481.
260	6.76	33.95	258	26.64	144.1	4.86	5.60	1481.
270	6.73	33.95	268	26.65	143.7	5.01	5.99	1481.
280	6.61	33.96	278	26.67	141.5	5.15	6.39	1481.
290	6.58	33.96	288	26.68	141.2	5.29	6.80	1481.
300	6.50	33.96	298	26.69	140.3	5.43	7.22	1481.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 76

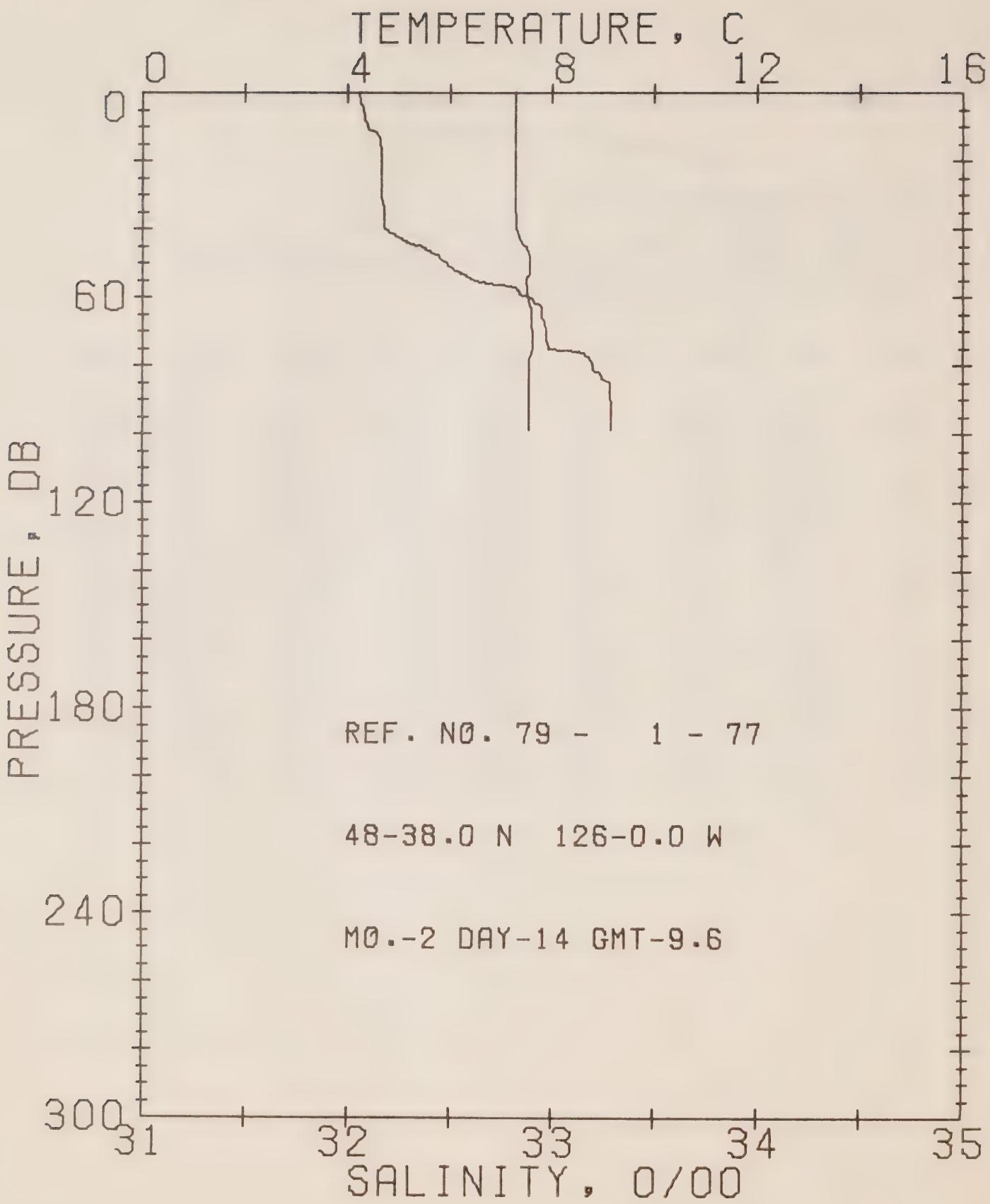
DATE 14/ 2/79

POSITION 48-42.0N, 126-40.0W GMT 7.0 STATION 3

RESULTS OF STP CAST 293 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.24	32.25	0	25.25	273.1	.00	.00	1476.
10	7.25	32.25	10	25.25	273.4	.27	.01	1477.
20	7.25	32.25	20	25.25	273.5	.55	.06	1477.
30	7.25	32.25	30	25.25	273.7	.82	.13	1477.
50	7.32	32.35	50	25.31	267.4	1.37	.35	1478.
75	7.94	33.43	75	26.07	195.8	1.94	.71	1482.
100	7.66	33.75	99	26.36	168.8	2.39	1.11	1482.
125	7.47	33.83	124	26.45	160.6	2.80	1.58	1481.
150	7.36	33.85	149	26.49	157.4	3.20	2.14	1481.
175	7.28	33.87	174	26.51	155.6	3.59	2.78	1482.
200	7.17	33.91	199	26.56	151.5	3.97	3.52	1482.
225	7.03	33.92	223	26.59	149.2	4.35	4.33	1481.
250	6.86	33.94	248	26.63	145.9	4.72	5.22	1481.
300	6.50	33.96	298	26.69	140.3	5.43	7.22	1481.
400	5.51	33.94	397	26.80	130.4	6.78	12.04	1478.
500	4.96	34.01	496	26.92	119.7	8.03	17.77	1478.
600	4.38	34.07	595	27.03	109.4	9.19	24.22	1477.
800	3.63	34.19	793	27.20	93.7	11.22	38.70	1477.



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 77 DATE 14/ 2/79

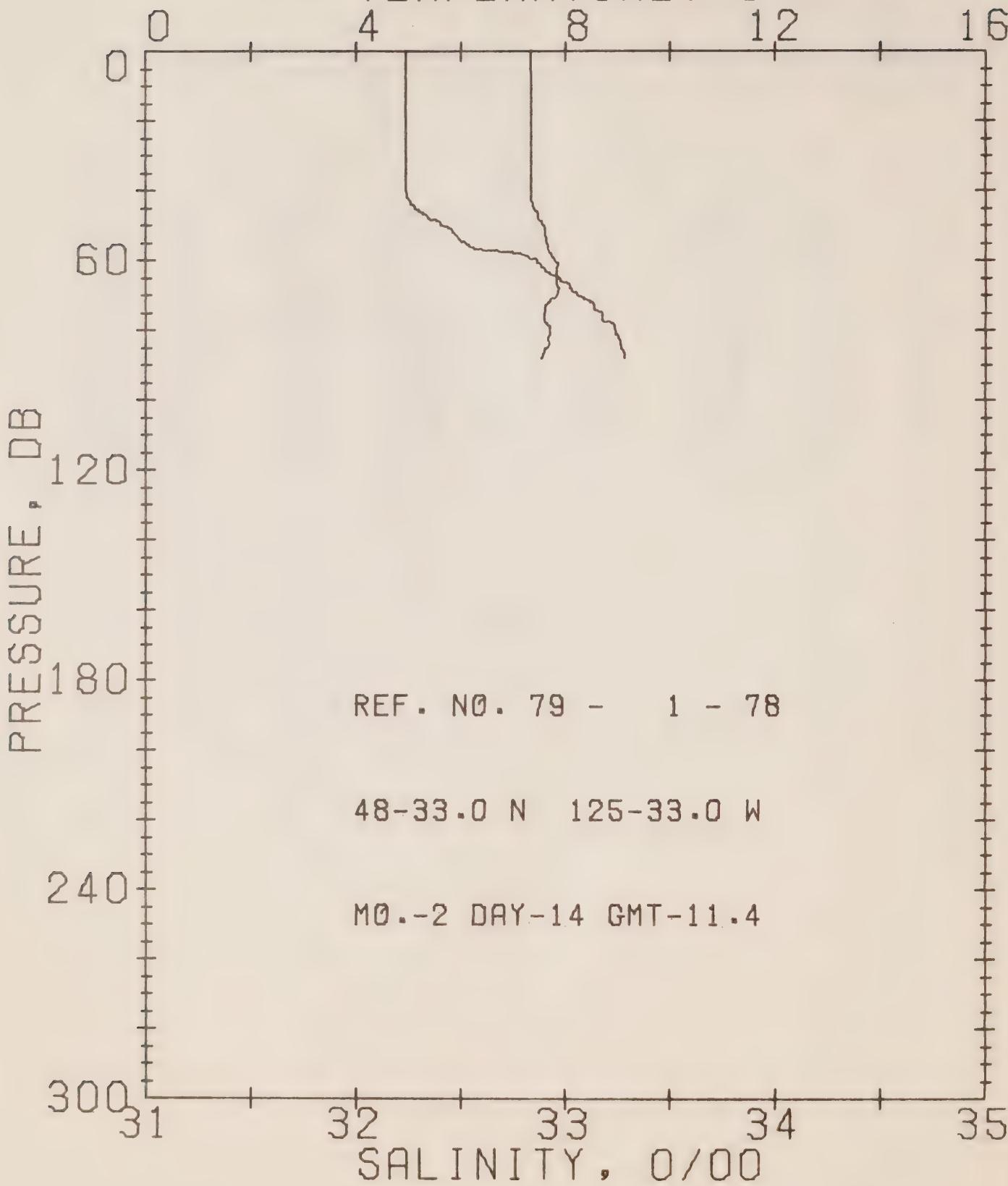
POSITION 48-38.0N, 126- .0W GMT 9.6 STATION 2

RESULTS OF STP CAST 56 POINTS TAKEN FROM ANALOG TRACE

GUIDELINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.29	32.05	0	25.08	288.7	.00	.00	1470.
10	7.29	32.09	10	25.12	285.8	.29	.01	1477.
20	7.29	32.16	20	25.17	280.7	.57	.06	1477.
30	7.29	32.16	30	25.17	280.9	.85	.13	1477.
40	7.30	32.18	40	25.18	279.6	1.13	.23	1477.
50	7.57	32.47	50	25.38	261.5	1.40	.35	1479.
60	7.54	32.88	60	25.70	231.0	1.65	.49	1479.
70	7.62	32.97	70	25.76	225.5	1.88	.64	1480.
80	7.55	33.19	80	25.94	208.4	2.09	.81	1480.
90	7.54	33.28	89	26.02	201.4	2.30	.99	1480.
100	7.54	33.29	99	26.02	201.1	2.50	1.18	1481.

TEMPERATURE, C



OFFSHORE OCEANOGRAPHY GROUP

REFERENCE NO. 79- 1- 78

DATE 14/ 2/79

POSITION 48-33.0N, 125-35.0W GMT 11.4 STATION 1

RESULTS OF STP CAST 55 POINTS TAKEN FROM ANALOG TRACE

GUILDLINE WAS USED, PRESSURES ARE INPUT

PRESS	TEMP	SAL	DEPTH	SIGMA T	SVA	DELTA D	POT. EN	SOUND
0	7.34	32.23	0	25.22	275.9	.00	.00	1477.
10	7.35	32.23	10	25.22	276.2	.28	.01	1477.
20	7.35	32.23	20	25.22	276.3	.55	.06	1477.
30	7.35	32.23	30	25.22	276.4	.83	.13	1477.
40	7.36	32.23	40	25.22	276.7	1.11	.23	1477.
50	7.60	32.41	50	25.32	266.6	1.38	.35	1479.
60	7.82	32.87	60	25.65	235.5	1.63	.49	1480.
70	7.85	33.00	70	25.80	222.0	1.86	.65	1481.
80	7.70	33.23	80	25.96	207.1	2.08	.81	1481.

Surface Salinity and Temperature Observations
(P-79-1)

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 79- 1

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DY	GMT		C	WEST
79	1	5	1750	32.026	7.5	123-30
79	1	5	1915	32.500	6.6	124- 0
79	1	5	2030	32.290	7.1	124-30
79	1	5	2150	31.905	6.9	125- 0
79	1	5	2315	31.741	6.4	125-33
79	1	6	58	32.299	6.5	126- 0
79	1	6	310	32.379	7.2	126-40
79	1	6	610	32.498	8.9	127-40
79	1	6	940	32.513	8.4	128-40
79	1	6	1306	32.429		129-40
79	1	6	1555	32.658	8.5	130-40
79	1	6	1900	32.696	8.3	131-40
79	1	6	2200	32.655	8.7	132-40
79	1	7	115	32.462	8.4	133-40
79	1	7	405	32.440	8.2	134-40
79	1	7	700	32.359	8.6	135-40
79	1	7	1000	32.500	8.5	136-40
79	1	7	1536	32.615	7.8	138-40
79	1	7	1910	32.661*	8.4	139-40
79	1	7	2230	32.598	7.8	140-40
79	1	8	215	32.592	7.3	141-40
79	1	8	555	32.613	7.8	142-40
79	1	8	1015	32.605	7.9	143-40
79	1	9	0	32.559	7.3	145- 0
79	1	10	0	32.596	7.2	ON STATION
79	1	11	0	32.562	7.2	ON STATION
79	1	12	0	32.557	7.1	ON STATION
79	1	13	0	32.582	7.2	ON STATION
79	1	14	0	32.557	7.2	ON STATION
79	1	15	0	32.547*	7.1	ON STATION
79	1	16	0	32.556	7.2	ON STATION
79	1	17	0	32.545*	7.2	ON STATION
79	1	18	0	32.595*	7.1	ON STATION
79	1	19	0	32.572*	7.1	ON STATION
79	1	20	0	32.556	7.1	ON STATION
79	1	21	0	32.553	7.1	ON STATION
79	1	22	0	32.560	7.0	ON STATION
79	1	23	0	32.568	7.1	ON STATION
79	1	24	0	32.562	7.0	ON STATION
79	1	25	0	32.578	6.9	ON STATION
79	1	26	0	32.580	6.7	ON STATION
79	1	27	0	32.563*	6.8	ON STATION
79	1	28	0	32.568	6.9	ON STATION
79	1	29	0	32.574	6.8	ON STATION

SURFACE SALINITY AND TEMPERATURE OBSERVATIONS
CRUISE REFERENCE NUMBER 79- 1

DATE/TIME				SALINITY	TEMP	LONGITUDE
YR	MO	DY	GMT		C	WEST
79	1	30	0	0/00	6.8	ON STATION
79	1	31	0	32.579	6.7	ON STATION
79	2	1	0	32.563	6.9	ON STATION
79	2	2	0	32.549	6.7	ON STATION
79	2	3	0	32.546	6.9	ON STATION
79	2	4	0	32.556	6.9	ON STATION
79	2	5	0	32.566*	7.1	ON STATION
79	2	6	0	32.572	6.8	ON STATION
79	2	7	0	32.580*	6.8	ON STATION
79	2	8	0	32.644*	6.5	ON STATION
79	2	9	0	32.632*	6.4	ON STATION
79	2	10	0	32.591	6.2	ON STATION
79	2	11	0		6.3	145- 0
79	2	12	106	32.602	6.9	142-40
79	2	12	835	32.630	6.9	140-40
79	2	12	1500	32.598	7.1	138-40
79	2	12	2200	32.528	7.1	136-40
79	2	13	412	32.485	7.1	134-40
79	2	13	1100	32.579*	6.8	132-40
79	2	0	1700	32.667*	6.1	130-40
79	2	13	2330	32.629	6.6	128-40
79	2	14	300	32.349	7.2	127-40
79	2	0	715	32.338	7.6	126-40
79	2	0	945	32.307	7.6	126- 0
79	2	0	1130	32.341	7.1	125-33
79	2	0	1330	28.257		125- 0
79	2	0	1520	26.706		124-30
79	2	0	1940	31.666		123-30

* DENOTES SALINITY SAMPLE TAKEN FROM A
BUCKET. ALL OTHER SAMPLES TAKEN FROM
THE SEAWATER LOOP

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